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INITIAL CONSTRUCTION SECTION
CONSTRUCTION PACKAGE #1

RFP No.: HSR 11-16

Executive Summary and Technical Proposal

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1. Ability to Meet Schedules

1. Ability to Meet Schedules

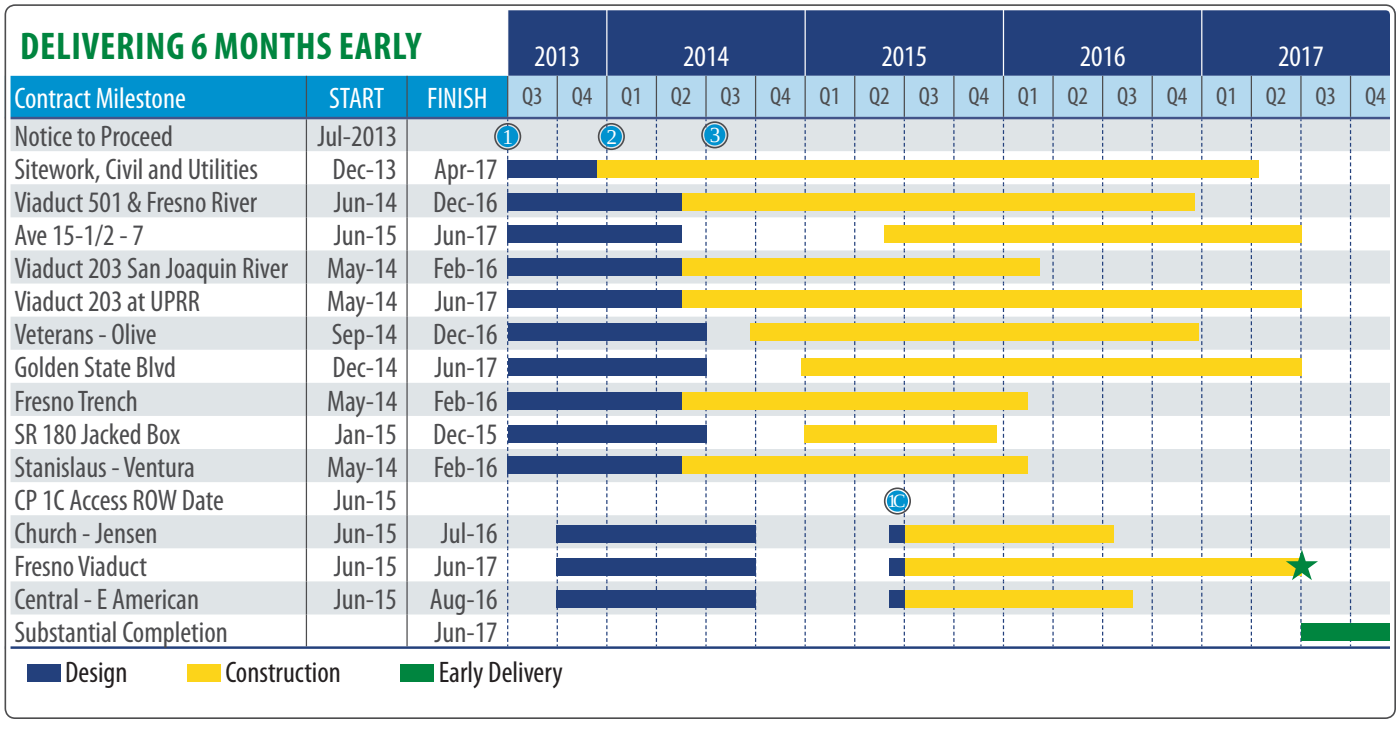
The success of the California High-Speed Rail Initial Construction Section Construction Package #1 (CAHSR CP1) project is critical to the continued ability to execute the entire 800-mile California High Speed Train (CHST) system. This will place great importance on the CAHSR CP1 project, as it has to set the tone for an on-time, on-budget, high-quality, community supported, transformative rail system.

Tutor Perini/Zachry/Parsons, a Joint Venture (TPZP), is a California-based team with major national and international experience and a history of success on landmark California design-build infrastructure projects, such as the $783 million Alameda Corridor Mid-Corridor Trench in Los Angeles and the $609 million BART SFO Extension design-build projects. These projects are very similar in nature, complexity and scope to this project, as they required numerous utility relocations and coordination with third-party owners; required coordination with governmental and local agencies for permitting and inspections; railroad coordination and relocations; extensive traffic control within limited right-of-way (ROW); and extensive coordination and constant interfacing with local city, county and state officials. TPZP has more than 2,900 employees in California, more than $200 million in relevant construction equipment, and extensive knowledge of the California construction market/practices to mobilize quickly and deliver this project to a date 6 months earlier than the 54-month schedule. Our joint venture member firms have a history of collaboration and are located in close proximity to the project and the California High-Speed Rail Authority (CHSRA). This commitment to effective collaboration, along with our years of experience on the largest and most complex railroad projects in the United States and around the world ensures that we will effectively combine our worldwide design and construction expertise. This technical proposal demonstrates our understanding of the CAHSR CP1 project requirements and challenges, our local knowledge, our technical proficiency as individual leaders in heavy rail, our decades of experience partnering with owners, and TPZP's local expertise with the resources and experience necessary to meet all of the project's goals.

> TPZP will deliver this project 180 days earlier than the required substantial completion date, with significant portions even earlier.

Figure 1-1 outlines our schedule milestones and addresses all challenges to the CAHSR CP1 proposal schedule. These will be discussed in more detail as we describe our ability, past performance, approach, and risk mitigation to deliver a date-certain project.

Figure 1-1: Proposal Schedule Milestones



*Our proposal will use these icons where we have met the California High-Speed Rail Authority's (CHSRA's) goals. These eight CHSRA targets, standards and criteria establish the framework to achieve substantial completion of a successful project. They include **targets** for schedule and budget; provide **standards** for safety, quality, verification and validation, sustainability, and environmental mitigation/compliance; and establish **criteria** for the use of small, disabled, and disadvantaged businesses. These icons will be used throughout our proposal to highlight key features and benefits of the TPZP team and our approach to delivering these goals.*

CHSRA PROJECT GOALS

1.1. PROPOSAL SCHEDULE

Both an electronic proposal schedule in Primavera P6 Professional Project Management XER format and an electronic TILOS linear schedule are included on the CD provided with this proposal submission. Printed copies of the proposal schedule are included at the end of Section 1.

1.2. CRITICAL PATH METHOD (CPM) NETWORK ANALYSIS CAPABILITIES

The CHSRA has specified Primavera P6 Professional Project Management as the primary software to be utilized for schedule management and time analysis. As previously stated, earned value is a major component to the evaluation of the physical progress of the project. One of the key elements to that evaluation is the time analysis, particularly, the analysis of the project's critical path(s). This project includes a variety of major structural elements being constructed in rural sections, environmentally sensitive areas, and urban settings, each with its own unique set of challenges. These challenges include extended parcel acquisition dates, design and permit considerations, seasonal construction windows, railroad restrictions, interfaces with utilities, and traffic phasing in multiple locations to facilitate the phased construction of the structures. All have significant potential to influence the critical path.

Construction activities will be planned to properly address these interfaces in terms of logic and then scheduled utilizing a combination of project calendars, limited constraints, and resource-adjusted durations to accommodate the time frames required to establish, refine, and maintain the project's critical path(s).

Construction is a dynamic enterprise, especially when the project entails more than 29 miles of variable terrain and design. The software specified provides excellent flexibility for the mathematical analysis of progress and parallel alternative planning, should it become necessary. More importantly, the TPZP team assembled has an enormous amount of relevant construction experience across all disciplines to provide the most practical and achievable solutions to schedule related issues, which can then be network tested and implemented.

1.3. SCHEDULE NARRATIVE

Expectations of the CHSRA

TPZP understands that the primary concern of the CHSRA is to make certain that the project is completed within its funding and time constraints while ensuring the highest standards of safety and quality. We understand that the timely delivery and notification of critical events or situations to CHSRA will be of vital importance, not only to the schedule, but also due to the impact they will have on cost savings. Further, because the CHSRA will work with Federal Railroad Administration (FRA) oversight, it is imperative that TPZP meet or exceed its expectations by providing continual updates regarding phasing and risks to the schedule.

Ability to Achieve the Planned Schedule

TPZP's experience in the design and construction of similar large civil projects (specifically in California), our ability to mobilize extensive local resources at a moment's notice, and the use of our design-build best practices will ensure that we deliver a successful project. Some initial best practices important to the schedule will be to facilitate successful partnering, establish and maintain early coordination, critical path method scheduling, and open lines of communication with major stakeholders:

- CHSRA
- Local communities
- Permitting agencies
- Third-party entities
- Railroads

Another best practice in controlling the schedule of the CAHSR CP1 project is to divide the 29-mile alignment into manageable segments. This approach will help maintain the design and construction schedules and promote a focused quality plan. Segments will provide necessary flexibility to efficiently allocate resources and equipment independent of ROW availability, permits, and critical path issues. These segments can be further divided into smaller manageable components to allow maximum small business (SB) and local firm participation, enhancing the overall job creation of the project. Our Project Manager/Director, Josh Randall, will lead our team, ensuring that the TPZP proposal schedule is maintained and that we meet the project goals.

Past Performance

Invaluable experience has been acquired by the principal members of TPZP while constructing numerous projects having nearly identical issues and complexities as those that will be encountered on the CAHSR CP1 project. TPZP has a proven track record of delivering large civil projects on time and, in many cases, early. We are proud of our diverse list of projects, each with unique challenges, including size, complexity, and schedule. The early start of critical path construction elements, constant communication, partnering and coordination with third parties, tight schedule controls, co-location, early design, construction workarounds, and monitoring ensured the on-time or early delivery of all of the projects noted in Table 1-1.

Successful Outreach Efforts to Maintain Business Operations

Tutor Perini went door-to-door on the Alameda Corridor Mid-Corridor Trench design-build project to identify business traffic requirements and adapted specific, temporary measures to accommodate. This outreach effort maintained a thriving business community, with no business interruption claims made against the owner.

One such project requiring critical agency coordination occurred on the $783 million Alameda Corridor Mid-Corridor Trench design-build project for the Alameda Corridor Transportation Authority (ACTA). The Tutor Perini-led joint venture included Parsons as both an equity partner and as principal designer for the project, which traversed six cities and the County of Los Angeles and encompassed an overall 15 mile-alignment. The scope of work included relocating several miles of both railroad drill track and storage tracks prior to construction of the U-channel. The U-channel design was for a 33-feet-deep, 50-feet-wide concrete trench structure constructed to accommodate more than 10 miles of parallel heavy freight rail track included in the project. The design required each local agency/city approval of their portion of the trench, and of the respective adjacent improvements. Those improvements entailed the complete rebuilding of major street arteries on both sides of the new trench totaling more than 100 lane miles of new roadway. The new structural pavement design in each affected city had to be negotiated and finalized with each engineering department.

Another issue related to protecting business operations during the complete reconstruction of Alameda Street. The Tutor Perini team went door-to-door to identify the specific business traffic requirements, such as customer and delivery access and parking, and then adapted specific temporary measures to deal with those issues. We have learned that the single most important mitigation for neighborhood businesses is to complete the work in front of their operation as quickly as possible. The net result of the outreach effort was to maintain a thriving business community and no business interruption claims made against ACTA.

The work scopes included interfacing with, designing and relocating numerous third-party utilities, both public and private. More than 50 utility companies were coordinated with to develop and implement maintenance of traffic plans and relocate or protect approximately 1,000 utilities that crossed over, under, or through the trench to accommodate construction.

The Tutor Perini team required extensive interface with the UPRR and BNSF to coordinate the design, the necessary track closures and cut-ins, and conduct construction in a manner to allow 15 freight trains a day to pass through the project limits. Key to our success was that the Tutor Perini team was flexible in creating workaround solutions to resolve problems without delaying the project. Construction was completed without interruption of rail service or highway traffic adjacent to the project.

This project was successfully completed under an aggressive schedule and for a lump sum, with no claims. The Alameda Corridor Mid-Corridor Trench project received many awards, including the Project Award from the Design-Build Institute of America and the American Society of Civil Engineers' Award of Merit and its Grand Award.

Another project very similar in both scope and complexity is the Tutor Perini-led joint venture $609 million BART SFO Extension project. Extensive agency coordination was required with two counties, five separate cities, SFO, numerous utilities, state and federal environmental agencies, Caltrans and Caltrain. The similarities between this project and the CAHSR CP1 project include the required at-grade, depressed and aerial sections of the rail grade alignment.

The entire project traversed several cities and included constructing both temporary and permanent bridge structures across the depressed trench excavation. Throughout construction pedestrian, vehicular and railroad traffic were maintained at all times. The most difficult and coordination-sensitive issue was working parallel to and transitioning from the west to east side of the existing Caltrain corridor twin tracks, which demanded proximity and construction time constraints. Tutor Perini negotiated additional work scope within the Caltrain corridor where the new SFO extension transitioned from the west side of Caltrain rail tracks to the east side of the tracks while going underneath the active lines. This work was successfully completed adjacent and under, with no impacts to Caltrain.

The BART SFO Extension project posed significant construction challenges, including densely populated neighborhoods, four cemeteries, four major shopping centers, a large casino, a courthouse, and a hospital located immediately adjacent to the project route. A large portion of the alignment passed through residential areas with several schools and heavily traveled pedestrian routes. Pedestrian (especially children) and vehicle safety and traffic management was wide-ranging and included 20 temporary bridges.

Crossing through multiple communities each with decidedly unique and challenging community issues required specific outreach plans combined with adjusted construction practices to minimize the community impact. For

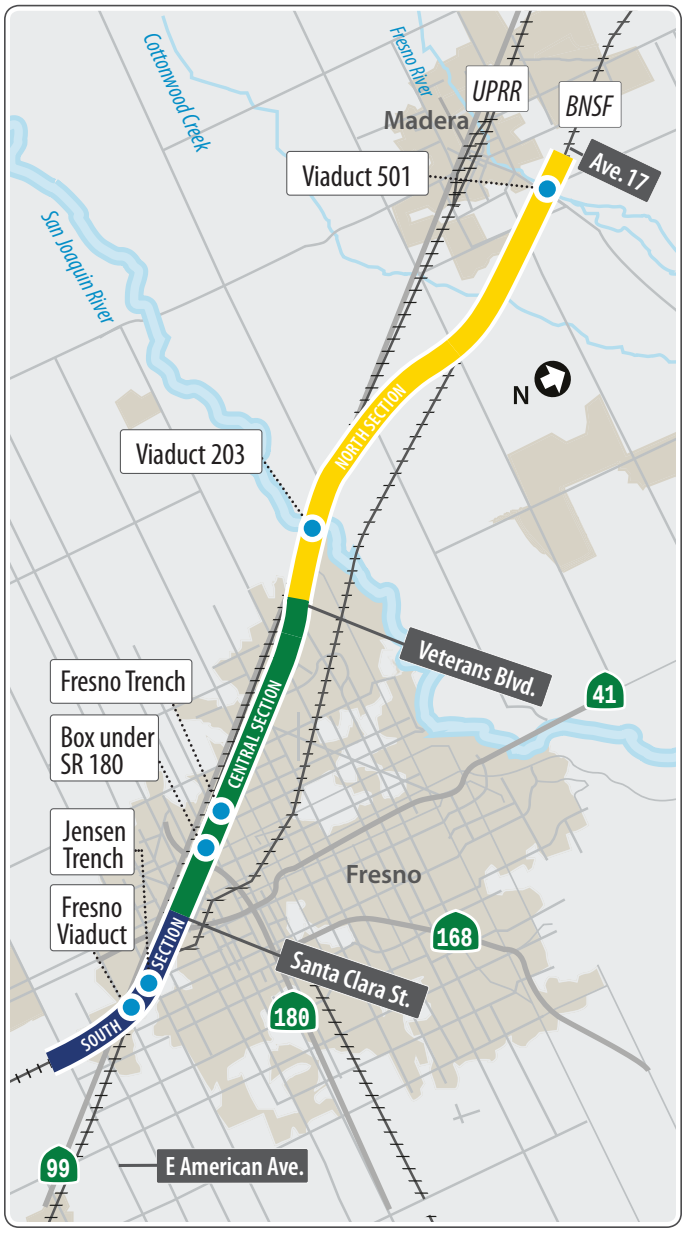
TPZP successfully delivered two California projects nearly identical in requirements for coordination and facilitation with multiple state and local governments and agencies, as well as numerous utility companies and railroads.

Table 1-1: TPZP's Past Performance for On-Time or Early Project Delivery

	Firm	Transportation Projects	Owner	Value	On Time or Early Delivery
	T	***BART SFO Extension*** A 15-mile extension from Colma to San Francisco International Airport built through densely populated neighborhoods, busy commercial districts, and an adjacent hospital	BART	$609	Extensive agency and stakeholder coordination was successfully completed and resulted in the project dealing directly with the community with minimal unforeseen impact.
	T	***Richmond-San Rafael Bridge Seismic Retrofit*** seismic retrofit of the 4.5-mile-long steel bridge with two spans across shipping channels.	Caltrans	$762M	Successfully completed on schedule, including owner-initiated change orders, such as a major addition for emergency deck repairs.
	TP	***Alameda Corridor Mid-Corridor Trench*** railroad transportation corridor, including a 10-mile-long trench and 29 bridges	Alameda Corridor Transportation Authority	$783M	Successfully completed on the original compressed schedule with an overall duration of 1,100 days, including scope added by ACTA to adjust final quantities of contaminated material clean up and additional utility modifications. Project won the Project Award from the Design-Build Institute of America.
	Z	***High Five Interchange*** project involved 43 bridges and a five-level interchange at the intersection of U.S. 75 and Interstate 635.	TxDOT	$288M	Successfully completed 11 months ahead of schedule. Project was awarded the Texas Construction Best of 2006 Judges' Award and the 2006 Topping Out Project of the Year.
	Z	***SH 130 Segments 5 & 6*** design-build project comprises 41 miles of road with 75 bridges and included the acquisition of 312 parcels (more than 3,000 acres)	TxDOT	$972M	Successfully completed this project on schedule, and was completed in November 2012.
	P	***I-25 T-REX*** design-build project consisting of 19 miles of new light rail transit and highway reconstruction.	Regional Transportation District	$1.3B	Successfully completed nearly 21 months ahead of schedule. This was accomplished by an aggressive, integrated design and construction team. Project won 35 awards.
	P	***Reno Transportation Rail-Access Corridor (ReTRAC)*** grade-separated rail alignment for the Union Pacific Railroad through downtown Reno, included a 2-mile depressed rail track, 35 feet deep and 54 feet wide.	City of Reno	$171M	Successfully completed on schedule. Project received the Outstanding Achievement in Civil Engineering award from the American Society of Civil Engineers.

Legend
T=Tutor Perini Z=Zachry Construction P=Parsons

Figure 1-2: Project Segments



example, the City of Colma consists almost entirely of 12 major cemeteries, 8 of them in very close proximity to the project, and 2 of them straddling the cut and cover portion of the project. Construction in this area required special handling to minimize the impact on ongoing cemetery operations, and maintain the dignity of the cemetery. The original pre-bid designed support-of-excavation system through the adjacent cemeteries was to install and remove temporary sheet piling utilizing vibratory hydraulic hammers. At a greater than estimated cost than the vibratory sheet piling system, a drilled secant piling system was utilized for those support-of-excavation areas through the adjoining cemeteries, which greatly reduced the amount of both noise and ground vibrations.

The project construction included working in various environmentally sensitive areas where environmental monitoring was extensive, including fugitive dust control, street cleaning, and noise and vibration control (especially next to the hospital). Construction of the aerial portion entailed crossing wetlands with two endangered species: the red-legged frog and the San Francisco garter snake. Extraordinary mitigation measures were required, including temporary elevated platforms, so that no construction touched the ground outside of bridge footing locations.

The experience from these projects allows our team to successfully apply proven scheduling procedures to the CAHSR CP1 project.

Scheduling Approach for Early Completion

As illustrated in Figure 1-2, TPZP's scheduling approach for early completion will focus on three major segments of the project for procurement, design, and construction. The North, Central, and South segments will each be managed separately, with their own engineering and supervisory staffs, equipment, and skilled labor forces to expedite the project. All the while, there will be overarching standards and practices applied to safety, quality, environmental compliance, and sustainability.

CP 1A, Hybrid Alternate (North Segment) – The northern segment of the project, designated as the CP1A Hybrid Alternative Segment in the request for proposals (RFP) documents, is approximately 14 miles long and extends from Avenue 17 in Madera County (north of the Fresno River) to north of Veterans Boulevard in Fresno (south of the San Joaquin River). The work includes two major high-speed train aerial structures, Viaduct 203 (Fresno River and SR 145 crossing) and Viaduct 501 (San Joaquin River crossing), a five-span high-speed train bridge crossing Cottonwood Creek, nine two-lane high-speed train overcrossing bridges, and the embankment for the high-speed train track.

The schedule for this segment is first driven by the permitting process and seasonal river construction restrictions for the spans over the San Joaquin River (Viaduct 501), and the Fresno River (Viaduct 203). These restrictions include limited work durations (within the wetted perimeter of the river channels) from June 15 to October 15 and within the floodway from April 15 to October 31 for flood protection issues. A second major factor will be the construction of the 12 straddle (outrigger) bents over the UPRR track in Viaduct 203, just south of the San Joaquin River. A third factor will be the nine overcrossing bridges

CP 1A "S" Alignment and CP 1B "S" Alignment (Central Segment) – The Central Segment of the project includes the CP1A Remaining Alignment Segment and the CP1B Segment and extends from just north of Veterans Boulevard to just south of Santa Clara Street in downtown Fresno, with the exclusion of the portion of work under Caltrans' scope of work as defined in addendum 4 of the RFP. The limits of the Caltrans work extends from just north of West Ashland Avenue to south of West Clinton Avenue, which is approximately two miles. The CP 1A and CP 1B alignments are approximately 8 miles long and 1 mile long, respectively. In addition to major road reconstruction, realignment, and detouring; building demolition; hazmat remediation; and high-speed train embankment, this segment consists of two canal crossings, five overpasses, one bridge widening, three bridge underpasses (under the high-speed train), two bridge undercrossings (UPRR), one pedestrian overcrossing, and one trench (Fresno grade separation).

The schedule for this segment is driven first by the permitting process with Caltrans, second by the installation of the jacked box under SR 180, and last by the shoring constraints for the Fresno Trench. Another major factor will be obtaining the UPRR approval that allows the installation of a shoofly for construction of two underpasses in downtown Fresno and the approval of

the San Joaquin Valley Railroad (SJVRR) for construction of the Fresno Trench under two active SJVRR spurs. It is required that one spur will remain open at all times during construction of the Fresno Trench.

CP 1C Alignment F1 (South Segment) – The South Segment of the project, designated as CP 1C in the RFP, extends from south of Santa Clara Street to just south of East American Avenue. This segment is approximately five miles long. In addition to major road reconstruction and realignment, building demolition, hazmat remediation, and the high-speed train embankment, this segment includes three overpasses and the Fresno Viaduct.

Staffing and Equipment

Based on the following assumptions, TPZP will staff the project with all of the labor and resources required:

- The project schedule is based upon receipt of NTP-1 from the Authority on July 1, 2013
- NTP-2 within 360 days of the proposal due date
- NTP-3 within 540 days of the proposal due date
- The schedule is calculated on a standard five-day, forty-hour week calendar that incorporates the CHSRA's specified holidays and environmental construction windows
- Normal weather patterns have been assumed
- Construction start dates and logic are based on the availability dates of parcels provided in the ITP's Right of Way Acquisition Plan documentation

To ensure an adequate and timely skilled labor force, TPZP will meet with local union business agents before mobilizing any skilled labor staff. These meetings are held to establish clear lines of communication and expectations, including staffing projections, skill levels needed, and dispatching and clearance processes. These meetings will also define standard procedures, including drug testing, safety, and quality. Meetings with the business agents will continue, as necessary, throughout the project. In addition, we will make the site accessible so that business agents will have opportunities to meet with their members.

To ensure timely completion, segment managers and superintendents for both design and construction will manage each segment of the work as a project within a project, focusing on delivery and mobilization of production staff to design or construct the project in compliance with criteria, standards, project plans, and specifications while meeting critical path delivery requirements. Since the senior professional and management staff required for the project are already employees of the major participant firms of TPZP, we will be able to mobilize to the project and continue our design within 30 days of NTP.

TPZP's proven ability to deliver on its commitments in California will ensure that the assumptions made for mobilization are carried out in a professional, cost-effective manner with the flexibility only offered by our California-headquartered team.

Each segment will have its own equipment requirements. As the owner of one of the country's largest equipment fleets valued at more than $200 million, Tutor Perini owns or is able to obtain any piece of equipment required for this project. Overall, the approach to executing the construction of the project will entail working multiple headings or locations with multiple work crews, each supported by its own individual pieces of construction equipment.

Design work started during the proposal will continue immediately following NTP-1, as required to support the critical path activities. We will complete design in a total of 15 months. The first month of design will support mobilization and early construction startup work. During the next 12 months we will fully mobilize the design team and complete all critical design activities. TPZP will use the last two months to clean-up all non-critical design elements, obtain final design approvals, and demobilize the design staff. A small staff of designers will remain after design completion and through construction to review shop drawings, respond to requests for information, help resolve nonconformance reports, issue field design changes, and prepare as-built plans.

Material Procurement

Long lead time material items have been identified and will be tracked from the design development phase through construction and installation. Our Level 2 CPM schedule has been adjusted by task. These specific details have been developed by integrated project schedule that prioritizes the design schedule to support timely procurement and delivery. TPZP will procure standard materials from readily available sources to ensure timely delivery. Specialty items, such as structural steel and precast elements, will be detailed and tracked separately in the project schedule with measureable completion dates. Project management will be informed of status during our weekly schedule reviews to ensure successful and timely deliveries of long lead time materials.

By integrating design and construction activities into a single CPM schedule, the critical path identified incorporates both design and construction needs. We have phased the design packages to meet submittal guidelines, support long-lead procurement items, and meet deadlines for critical construction work elements.

Mobilization Plan

The design-build delivery of the CAHSR CP1 project presents a series of mobilization challenges, including personnel, materials and equipment. TPZP offers a unique blend of capacity and expertise based in California. Tutor Perini is the largest contractor headquartered in California, and Parsons is the second largest designer headquartered in California, among the shortlisted teams, according to Engineering News-Record (ENR). This means that TPZP has ample resources in the state to commit a core of available, highly-experienced personnel that can be augmented on an as-needed basis. As one example of TPZP's proven ability in this arena, Parsons mobilized 125 design staff within the first 30 days on the $535 million The New I-64 design-build project for MoDOT.

Immediately following contract award, TPZP will secure all required post-award documentation and will begin implementing our mobilization plan.

TPZP will acquire necessary facilities for the project staff, including necessary permits, within 30 days after NTP.

TPZP will submit required documents, including a project-specific health and safety plan, quality management plan, security plan, environmental management plan, public involvement plan, interface management plan, and interim and baseline schedules.

Design work will support the critical path activities, including the development and completion of early-release work packages within 180 days after NTP.

As access to the corridor becomes available and as utility relocations allow, TPZP will mobilize our construction operations. Construction materials and equipment will be mobilized within 90 days after NTP. As property in the ROW becomes available, verification of ROW, clearing, grubbing, and demolition with appropriate storm water pollution prevention plan (SWPPP) measures will commence, along with the construction of a temporary security fence along the ROW. We will perform potholing throughout the corridor to confirm existing utility locations and to verify relocation requirements, and we will conduct remedial soil testing to confirm levels of potential contaminated soil in expected excavations. Concurrently, TPZP will keep all stakeholders aware of the progress and will meet with third-party utilities to coordinate relocation schedules.

TPZP will identify the utility locations not affected by street closures as an early work activity. The team will coordinate other utility relocations that we can perform with other drainage and underground work while coordinating street diversions, detours, and closures. TPZP will stage materials and equipment within the project ROW. Vendors will procure and store equipment requiring weather protection using just-in-time delivery.

Critical Path

Significant constraints exist in each individual segment that have the potential to alter the project critical path during construction.

The schedule for this segment is driven first by the design and permitting process (the City of Fresno and Caltrans) for the Fresno Viaduct. A second factor is the deletion of the construction of the Jensen Trench, which may be eliminated after design development (see Section 4.8. Approved Alternative Technical Concepts).

TPZP has developed a schedule that accommodates the known constraints and optimizes the distribution and sequence of equipment, material, and manpower. Right-of-way (ROW) parcel access and environmental windows play a significant factor in determining the critical path(s). Portions of the substructures of Viaducts 501 and 203 can only be constructed during the dry season of June through October.

Viaduct 203 (San Joaquin River): The path is controlled by design, permitting and load test program for the caissons. Because of seasonal restraints, the load testing must be completed in early 2014 to allow for the installation of piles located in the river, which will be completed during the 2014 construction window. Load testing will be accomplished first at Viaduct 203 after which production pile installation will begin. Once piles are underway the balance of substructure and superstructure construction will commence with completion in June 2017.

Viaduct 501 (Fresno River): After load testing is completed at Viaduct 203, the equipment will be moved to Viaduct 501. Once testing is completed, production piles will commence completing all river piles during the 2014 season to avoid a one-year delay. The balance of substructure and superstructure construction will follow. The balanced cantilever section of the bridge will be constructed followed by the cast-in-place girder sections completing in late fall 2016.

Fresno Viaduct: Once the 12-foot diameter production piles are completed at Viaduct 501, the test equipment will move to the Fresno Viaduct. The start of the load test pile installation is controlled by Package 1C ROW parcel access of June 25, 2015, 24 months after NTP-1. A second project critical path begins with ROW parcel access, with demolition, utility relocations, pile installation, and earthwork beginning June 25, 2015. This early start of construction is due to early geotechnical borings and engineering, which will be performed at the TPZP's risk and nearly completed prior to NTP-3. The critical path runs from the load test piles, to production piles, to columns to bent caps, to precast girders, completing in June of 2017.

Golden State Boulevard: Another short critical path is generated by ROW parcel access between Herndon canal and Veterans Blvd. Parcel 505-080-22 is not available until November 24, 2016 (month 41). This availability controls the demolition, utility relocation, Golden State Blvd. construction, and the new mainline bridge over Herndon canal, as well as trackway construction, which completes in June of 2017.

Overcrossings: Parcel access dates control the road overcrossings. In general, more early work is available south of Herndon canal than north. Therefore, initial efforts will be applied to the work in downtown Fresno, which also supports the pre-requisite work for the UPRR shoofly installation. As crews, forms, and parcels become available, overcrossing work will commence north of the San Joaquin River. Bridge overcrossing construction between Avenue 15 1/2 and Avenue 10 is critical.

Risks Mitigation Strategy

Major risks to the schedule and proposed mitigation strategies are described in Table 1-2.

1.4. QUALIFICATIONS OF THE PRINCIPAL SCHEDULER

Leading the scheduling effort will be Patrick Granfors, Tutor Perini's most experienced project scheduler, with more than 35 years of transit, heavy, and building construction experience and more than 27 years of direct involvement in project controls on more than 50 complex, schedule-driven projects. Since 1992, Patrick Granfors has led the Tutor Perini in-house scheduling department. He personally works with project management staff to ensure that schedules and schedule personnel are specifically tailored to project needs/demands and that the schedule reporting processes employed provide early detection of schedule deviations. In addition, he manages and augments the TPZP project scheduling staff, providing technical guidance and ensuring constructability on a daily basis. He has effectively performed the function of on-site scheduler on multiple projects, and he will provide a level of continuity that will be of great value to the TPZP Project Manager/ Director, Josh Randall, and the CHSRA.

A significant portion of Patrick's direct involvement with transportation sector construction scheduling has included 12 rail transit projects with 5 different transit authorities throughout California, which have provided him with technical insight and geographical perspective. Some of the major

Table 1-2: Risk Mitigation Strategy

Schedule Risk	Description	Mitigation Strategy
Mobilization of Design Team	Mobilizing a design team for a large, complex project could be a challenge, especially for a design team not locally based.	TPZP is California-based and has committed to mobilize within 30 days after NTP.
ROW Acquisition Dates	Of the 465 parcels, 81 percent are acquired in less than 15 months after NTP. Within 27 months, 98 percent will be acquired. Within 39 months, all but two parcels will be acquired, which will be delivered by November 24, 2016. Although this will have a minimal impact on most locations, critical construction areas will have impacted schedules due to parcel acquisition.	Late parcels will utilize separate early design packages and construction workarounds, which will focus on adjacent sides of the critical area first, then accelerate completion of the critical area.
Differing Site Conditions	Subsurface or latent physical conditions encountered at the exact boring locations included in the contract documents may differ materially from actual conditions. These unknown physical conditions of an unusual nature may impact the schedule.	Mitigation will include early design packages and construction workarounds to adjacent sides of the critical area first, then accelerating completion of the critical area.
Permitting	The delay in obtaining federal, state, or local floodplain encroachment, water crossing, or other pertinent permits is a potential challenge. A delay in obtaining the U.S. Army Corps of Engineers 404 permit, the State Water Resources Control Board 401 permit, or the Fish and Game 1602 permit, compounded with current work restrictions in the river channel (no work is allowed in the river channel from June 15th to October 15th), could cause major delays on the San Joaquin River crossing.	Early identification of required permits and expedited submittal and follow-through (working to identify solutions, not conflicts with the governing agencies), will alleviate impacts to the schedule, as we have demonstrated on the BART SFO Extension; Alameda Corridor Mid-Corridor Trench; SH 130 Segments 5 & 6; and TRIP/Bakersfield Program Management projects.
Changes in Current Statutes or Laws	Changes in laws or statutes can cause a major delay to the project schedule (e.g., the requirement by the Central Valley Flood Control Protection Board (CVFCB) that a new 200-year design flow be developed for all natural water body crossings [in lieu of the current 100-year design]). The requirements of the 200-year design flow may not be known until 2015.	Mitigation may include early identification, expedited submittals, as well as early design packages and construction workarounds to adjacent sides of the critical area first, then accelerate completion of the critical area.
Railroad Agreements	Based on the past experience with the UPRR and the BNSF, TPZP anticipates that the railroads will expect no adverse impact on their freight operations in the corridor during construction. A draft engineering and construction agreement for the CAHSR CP1 project has been prepared (Addendum 8, Book 2, Part D-7). There are some activities that the UPRR is expected to perform, such as constructing shoofly tie-ins and signal design, which could impact the schedule.	Understanding railroad agreements has allowed TPZP to adjust our schedule to avoid delays. If additional mitigation is needed, early design packages and construction workarounds may be used.
Delayed NTP of CP 1-C (NTP 2)	Schedule delays could result if NTP-2 (Bid Package 1-C) is not issued with NTP-1, but rather up to 540 days after the proposal due date. Some of the impacts will be the reuse of earthwork materials (or possible earthwork borrow) and possible delay of steel mill roll dates.	Working with the CHSRA to ensure the early release of CP 1-C will minimize schedule impacts. If additional mitigation is needed, early design packages and construction workarounds may be used.
Utility Relocations/ Installations	Third-party utilities may delay the planned start of construction or exceed the durations in TPZP's schedule.	A TPZP task force will expedite work with third-party entities to resolve conflicts.
CHSRA and Stakeholder Design Review and Approvals	Design review and approvals beyond the allowed durations can be delayed for a variety of reasons and can impact the project schedule.	TPZP will commit qualified staff to create a harmonious working review and approval environment that will ensure early submittals while avoiding unwarranted delays.
Hazardous Materials	Hazardous materials beyond those anticipated in the contract can cause delays to the schedule.	Early identification, mitigation, and disposal will resolve untimely delays due to hazardous waste encounters. If additional mitigation is needed, early design packages and construction workarounds may be used.
Interface with Work by Others	Concurrent work on SR 99 by Caltrans and interface work by third-party entities can cause delays to the schedule.	A TPZP task force will expedite interface work with third-party entities to resolve conflicts and ensure early completion.

Leading the scheduling effort will be Patrick Granfors, Tutor Perini's most experienced project scheduler, with more than 35 years of transit, heavy, and building construction experience and more than 27 years of direct involvement in project controls on 50 complex, schedule-driven projects.

transportation projects and programs Patrick has contributed to include the following:

- $783 million Alameda Corridor Mid-Corridor Trench
- $609 million BART SFO Extension
- $1.2 billion McCarran International Terminal
- $1.1 billion San Francisco Airport Expansion
- $762 million Richmond-San Rafael Bridge Seismic Retrofit
- $281 million I-80 San Francisco Bay Bridge West Approach

TPZP's will utilize its long-term close relationships and experience with the union business agents to mitigate labor disruptions, and will ensure that a highly-skilled, highly-trained local workforce is assigned to the project. Due to these close relationships, Tutor Perini has never had a strike on any project.

1.5. REPORTING PROGRESS AND PROJECT MEETINGS

TPZP will take a proactive role in progress reporting. The specifications provide for the submittal of monthly schedule updates, effective the 28th day of each month. The update consists of the specified electronic data files and hardcopy reports, including narratives, network diagrams, tabular activity listings in various sorts, resource reports, and cost reports containing the required performance measurement metrics. Actual progress will be gathered during weekly site meetings with the CHSRA, subcontractors, and other project participants, where it will be compared to the previous three-week look-ahead schedules prepared and distributed at each meeting. In addition, physical observations and measurements will be made throughout the month. The information will be correlated, evaluated, and input into the project schedule for calculation and analysis.

Table 1-3: Project Meetings and Descriptions

Meeting Description	Frequency
MEETINGS WITH THE CHSRA	
Construction Coordination (during construction)	Daily
Owner Progress Meeting	Weekly
Design Coordination	Bi-weekly
SB Plan Implementation	Monthly
Independent Design Technical Review	As needed
Permit Approval Task Force	Monthly
Environmental Management	Monthly
Schedule Review Meeting	Monthly
Comment Resolution Committee	As needed
Design Review	At submittals
Project-Level Partnering	Ongoing
Executive-Level Update/Partnering	Quarterly
MEETINGS WITH THIRD PARTIES (MAY INCLUDE THE CHSRA)	
Constructability	Weekly
Caltrans Coordination	Monthly
Third-Party Stakeholder Task Force	Monthly
Utility Coordination	Monthly
Community Meetings	As needed
Public Safety	As needed
Stakeholder	Semiannual
TPZP INTERNAL MEETINGS	
Discipline Task Force (design)	Weekly
Safety and Security	Weekly
Preconstruction/Pre-mobilization Safety	Monthly
Quality Task Force	Monthly
Subcontractor Coordination	Quarterly
Executive Committee (JV Board)	Quarterly

Once the information is complete in draft form, TPZP will convene with the CHSRA's representatives during a regularly scheduled monthly meeting to discuss the update in advance of its submission.

In addition to the schedule progress review, the monthly meetings will include such topics as design status, product submittal status, procedure status, permitting status, procurement status, coordination with third parties, contract compliance, and any other subject that requires discussion or attention.

Independent technical review meetings will be held as often as necessary, as shown in Table 1-3, to improve the overall engineering process and to expedite deliverables.

Other meetings to facilitate collaboration and cooperation, including periodic partnering workshops, will be scheduled. The objective of these meeting will be to commit all parties and resources to the success of the project and quick identification and resolution of conflicts. The fundamental values of partnering: fairness, cooperation, open and honest communication, and teamwork/joint problem solving will ensure that the CHSRA is included in critical decisions and is kept aware of schedule progress to ensure that we meet contract milestones.

2. Project Approach

2. Project Approach

2.1. PROJECT MANAGEMENT PLAN (PMP)

Following lessons learned and experience gained on $26 billion in design-build projects, Tutor Perini/Zachry/Parsons, a Joint Venture (TPZP), details in this section our approaches to management, organization, teaming, small business (SB) involvement, design, construction, outreach, and sustainability.

> The design portion of the quality control (QC) plan will be developed in accordance with ISO 9001:2008 standards and will meet Federal Transit Administration (FTA) and contract requirements, which is currently being implemented on the $1.4 billion Houston Metro Solutions design-build project.

In our meetings with California High-Speed Rail Authority (CHSRA) staff, our discussions with local partners, and our review of the request for proposals (RFP), we have developed a solid understanding of the project requirements, CHSRA goals, and community concerns. This understanding is reflected in our approach to the project, as discussed in this section. Because the California High-Speed Rail Initial Construction Section, Construction Package #1 (CAHSR CP1) project is the first construction contract to be issued, we realize the importance of completing our work on or ahead of schedule, at or under budget, while providing sustainable solutions for design and construction and delivering a quality product that will set the standard for future contracts.

Our approach is focused on achieving these project objectives, and it employs the best practices that we have developed while successfully completing major transportation projects. Examples of this include the following:

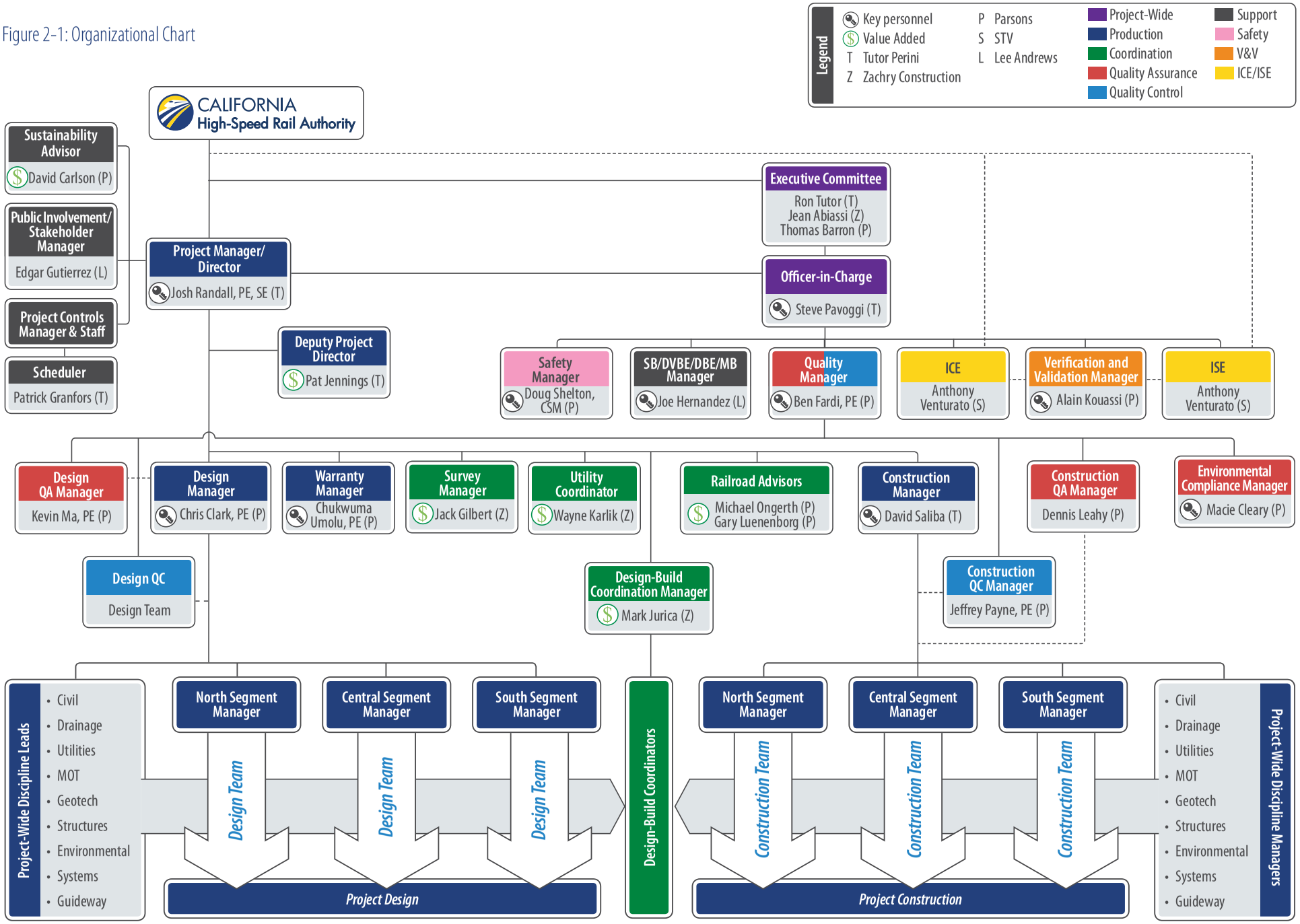
- $609 million BART SFO Extension (Tutor Perini)
- $1.4 billion Houston Metro Solutions (Parsons)
- $967 DFW Connector (Zachry)

These PMP practices include establishing clear lines of communication and authority using task forces to address specific project issues; working collaboratively with our partners and stakeholders; carefully and constantly monitoring schedule and cost; providing independent and thorough quality assurance (QA) and validation and verification (V&V); developing and implementing sustainable practices in both design and construction; and putting a priority on our core value, safety. Some of the key elements of this approach and its benefits are summarized in Table 2-1.

Table 2-1: Approach to Achieving Project Goals

TPZP Approach	Benefit
Communication and Authority	All participants and the public have a clear understanding of the work being planned and performed. Decisions are documented and clearly understood.
Task Forces	Specific, focused task forces deal directly with project issues, expediting implementation during both design and construction.
Collaboration	Working as a team with a common goal reduces disputes and misunderstandings, helping to maintain project progress.
Monitoring	Careful, ongoing monitoring of schedule and cost provides opportunities to detect negative trends and to implement solutions.
QC, QA, V&V, Independent Checking	An emphasis on quality and the use of experienced quality managers ensures that the completed project will meet the highest standards and will serve as an excellent base upon which future contracts (systems, trackwork, stations) will be built. Our ISO 9001:2008-certified process is at the core of this approach.
Dedicated Managers for Key Elements: Safety, Quality, V&V, SB, and Sustainability	The TPZP organization has identified specific, highly experienced managers who will report directly to either the Officer-in-Charge or the Project Manager/Director. This will ensure that the team properly addresses these critical components of the project.

Figure 2-1: Organizational Chart



2.1.1. Project Governance

The TPZP team is a joint venture of Tutor Perini Corporation (Tutor Perini), Zachry Construction Corporation (Zachry), and Parsons Transportation Group Inc. (Parsons), with Tutor Perini serving as the managing partner. A design-build joint venture (DBJV) executive committee, consisting of Ron Tutor (Tutor Perini), Jean Abiassi (Zachry), and Thomas Barron (Parsons), will provide overall governance of the design-build team, which will report to the CHSRA. Our organizational chart is shown in Figure 2-1.

Ron is Chairman and CEO of Tutor Perini and is a nationally recognized leader in the heavy construction business. Headquartered in Sylmar, Tutor Perini has more than 1,300 employees in California. Jean is President and COO of Zachry, a worldwide leader in heavy civil construction. Thomas is Executive Vice President of Pasadena-based Parsons Corporation, the parent company of the 3,200-employee business unit Parsons Transportation Group Inc.

Steve Pavoggi, Operations Vice President of Tutor Perini, will be the joint venture **Officer-in-Charge.** Steve Pavoggi has more than 25 years of experience in the construction industry, covering all facets of general contracting and focusing on public works and design-build projects. He has overall responsibility for multiple, concurrent major civil construction contracts. He is highly skilled and knowledgeable in all phases of construction, including estimating, preconstruction, value engineering, subcontracting, field construction, cost control, scheduling, quality control, and overall contract administration. Steve has extensive experience in the construction of runways, bridges, and highways and in supporting excavation for cut-and-cover transit tunnels. Steve will report directly to the CHSRA and to the executive committee, which will meet on a monthly basis to review progress and to address project issues.

TPZP's Project Manager/Director, Josh Randall, will report to Steve, the executive committee, and the CHSRA. Josh Randall has more than 45 years of experience in the construction industry, covering all facets of general contracting, from public and private works to design-build projects. He has had overall responsibility of multiple, concurrent major civil construction contracts. Josh served as the project executive for the $800 million LA Metro Rail extension program in Los Angeles and for the $609 million extension of BART to the San Francisco International Airport.

Work on the project will be advanced in three geographic segments: the North Segment, the Central Segment, and the South Segment, as shown in Figure 2-3. Individual managers will be assigned for the design and the construction of each segment. In addition, project-wide discipline leads will be assigned to deal with project-wide elements, such as structures, drainage and utilities, environmental mitigation, allowance for future systems, and other technical components that apply to the length of the entire project.

Value-Added Positions

Our organization includes several value-added positions that will allow the team to address project-specific issues. These are not specified key personnel; rather they provide additional expertise and facilitate the delivery of the project. These include the following:

Deputy Project Manager – Pat Jennings. A senior project manager with more than 38 years of experience, Pat has served as project manager for the $259 million Caldecott 4th Bore Tunnel and Building and the $609 million BART SFO Extension in the San Francisco Bay Area. Pat will assist Josh Randall in the day-to-day management of the project.

Design-Build Coordination Manager – Mark Jurica. In his 25-year career, Mark coordinated multiple design and engineering and construction efforts, including TxDOT's $972 million SH 130 Segments 5 & 6 project. Mark's experience will be invaluable in coordinating the efforts of the design and construction teams.

Utility Coordinator – Wayne Karlik. Wayne will be the key and single point of contact with the private and municipal utilities during both design and construction. This position will keep communications open, clean, and direct.

Survey Coordinator – Jack Gilbert. Similar to the role of the utility coordinator, Jack, the Survey Coordinator, will serve as the central point of contact for design and construction staking surveys. This will facilitate our design and construction operations.

Railroad Advisors – Michael Ongerth and Gary Luenenborg. Michael is a retired UPRR senior executive experienced in agency coordination. Gary, also recently retired from the UPRR, served as general director for design, based in Omaha, Nebraska. Both advisors are now employed by Parsons and are available to assist in and expedite the approval of design and construction with the UPRR, BNSF, and the SJVRR.

Sustainability Advisor – David Carlson. David is a nationally recognized leader with direct experience with the best sustainability practices. Now Parsons' Director of Sustainable Development for Transportation, he has previous sustainability experience with the Federal Highway Administration (FHWA) and the U.S. Environmental Protection Agency (EPA). He will provide direction and monitor the team's sustainability program.

> In addition to key personnel, we have named value-added personnel who will serve in critical positions on the team. They are all national or local industry leaders uniquely qualified for their assigned roles.

2.1.2. Quality Technical Compliance

TPZP understands the importance of the four quality processes identified below to the successful delivery of the CAHSR CP1 project, and we have the proven experience to fulfill these responsibilities. Utilizing ISO 9001:2008 quality principles and best practices of V&V with self certification adapted to a large civil infrastructure project, TPZP will deliver a technically compliant project for the CHSRA. Our quality program will operate with four levels:

- Quality Control (QC)
- Quality Assurance (QA)
- Verification and Validation (V&V)
- Independent Checking Engineer/Independent Site Engineer (ICE/ISE)

ISO-Certified Design Process

To maintain its ISO 9001:2008 certification, Parsons conducts annual QA audits of its offices to document adherence to the quality program. The TPZP executive committee will review the results of the project audits.

QC, QA, V&V, and ICE/ISE will verify quality and that the CP1 technical requirements are met. These functions are independent of production, reporting to the Officer-in-Charge, Steve Pavoggi. They all have the authority to stop work when warranted.

Quality Management – Ben Fardi will serve as the overall Quality Manager. Ben has more than 28 years of directly related quality management experience. Ben will develop the project Quality Management Plan (QMP), see that the plan is effectively executed, and direct all quality personnel.

Quality Manager – Ben Fardi, PE

With more than 28 years of experience, Ben will ensure that the CAHSR CP1 project is built to the highest quality standards. He has served as quality manager on similar projects, such as the $783 million Alameda Corridor Mid-Corridor Trench with Tutor Perini and the $868 million Los Angeles to Pasadena Metro Extension projects.

Design QC/QA – The TPZP design team is led by Parsons, an ISO 9001:2008-certified firm. A project-specific Design Quality Management Plan (DQMP), based on ISO 9001:2008 standards, will be prepared and incorporated into the overall project QMP to address all quality-related design issues for the CAHSR CP1 project. All design team members will be required to comply with the design QC criteria and the project-specific DQMP. TPZP will provide specific instructions and training regarding reviewing and following guidelines, checking procedures, and methods of documentation and follow-up. The DQMP will use a formal drawing-checking process and peer review. Design QC checkers with experience comparable to the original designer will be used.

Parsons' quality assurance procedures require that all design analyses, drawings, specifications, cost estimates, other contract documents, and reports produced by the design team be checked before submission to the CHSRA. Kevin Ma will serve as the TPZP Design QA Manager. Kevin will manage the DQMP and is independent of the design team. Kevin will review all design documents to ensure design QC and will send his comments to the design manager for interdisciplinary review. Kevin has 34 years of experience and expertise in quality systems, compliance, design, and construction.

Design QA Manager – Kevin Ma, PE

Kevin has 34 years of experience and expertise in quality systems, compliance, design, and construction. He recently served in similar quality roles on the $868 million LA Metro Mid-City Exposition Light Rail Transit, the San Francisco Caltrain Downtown Extension, and the $365 million BART Oakland Airport Connector projects, where his responsibilities included training project personnel, preparing project design quality management plans and procedures, and performing project audits.

Construction QC/QA – The TPZP QMP incorporates a thorough construction QC process that will be administered by the Construction QC Manager (CQCM). The CQCM is functionally independent from construction team members, but has direct interface with the construction team. The CQCM has the responsibility for construction QC inspections, tests, and issuing nonconformance reports, where appropriate. TPZP's CQCM will be Jeffrey Payne who brings more than 27 years of similar experience to this project.

CQCM – Jeffrey Payne, PE

With more than 27 years of experience, Jeffrey will manage and supervise the construction QC program. His responsibilities have consisted of the construction inspection, supervision, and management of several projects in California, including the $1.25 billion TRIP/Bakersfield Program Management contract. Jeff was also a Caltrans resident engineer on the SR 180 and SR 41 projects in Fresno.

TPZP is also responsible for construction QA, which will ensure construction QC via inspections, testing, and audits. The construction QA process will function independently from the production of the project. TPZP's Construction QA Manager will be Dennis Leahy who brings over 30 years of similar experience to this project.

Construction QA Manager – Dennis Leahy

With more than 30 years of experience in design and construction QA/QC, Dennis Leahy will manage the construction QA process. Dennis' experience includes similar roles on the $259 million MIA Mover Automated People Mover System and the $1.3 billion I-25 T-REX design-build project in Denver.

V&V – TPZP's V&V group will be part of our quality group and will consist of internal resources led by our V&V Manager, Alain Kouassi. He has more than 22 years of professional V & V experience involving systems engineering, integration, operations planning, management consulting, and business development.

Early coordination with the various stakeholders in the final certification of the project will be emphasized. TPZP will use several systems engineering process activities, as well as several systems engineering support functions, during our V&V efforts. We will start with IEEE1220 and IEC15288 and their general provisions and will establish a tailored approach that fits this project, including its major civil and structural elements. During the design phase, TPZP will produce detailed designs that meet the requirements; that define key interfaces; and that facilitate the development, integration, and future maintenance and upgrades of the overall project. In addition, all third-party designs under contract to the CHSRA will undergo a complete V&V evaluation. During the construction phase, TPZP will verify that the project, including third-party elements, is constructed in accordance with the design, specifications, and verification plans and procedures. We will confirm that all quality interfaces have been correctly implemented.

Alain Kouassi – V&V Manager

Alain Kouassi has 22 years of system integration management, including the $868 million LA Metro Mid-City Exposition Light Rail Transit project and the $8.3 billion New York City East Side Access project. His experience includes developing and managing V&V processes, including requirements management, design coordination, interface management, configuration management, testing and commissioning, and safety certification.

ICE/ISE – To further ensure project quality, an independent assessment of contract management submittals, design deliverables, construction documents, the construction process, as-builts, and changes will be conducted by STV, Inc., serving as TPZP's ICE/ISE. STV is well-qualified in this role, as discussed in Section 5.7. The key ICE/ISE staff will attend all contractual and technical meetings to observe the progress of design and construction and to track issues as they arise. This will keep the ICE/ISE current on work effort and trends, thus enabling the real-time monitoring of progress and issue resolution, so reporting to the CHSRA will be comprehensive.

ICE duties will include reviewing each design package at the design's QA interdisciplinary review stage, performing independent structural calculations done in parallel with the design team, facilitating joint workshops that will include CHSRA representatives if discrepancies are noted to isolate the problems and resolve them, and documenting all TPZP design submittal reviews. ISE duties will include observing construction activity and attending all construction witness and hold meetings; taking of random samples of materials and installations, obtaining results from an independent test lab and comparing results with the TPZP's test reports; and conducting repeat testing when any discrepancies outside of pre-established, reasonable tolerances occur. Self-certification of the project elements will occur, with the ICE/ISE performing a full compliance check against the technical contract requirements of all TPZP draft V&V submittals. Any discrepancies will be rectified by TPZP and signed off by the ICE/ISE for technical adequacy and compliance with contractual terms in accordance with the approved V&V plan before formal submittal to the CHSRA.

Anthony Venturato will serve as the ICE/ISE Manager. Anthony is a vice president and program manager with 40 years of experience in transportation projects, including several transit systems: the $2.8 billion DART Phase I and Phase II design-build; the $450 million Houston Metro LRT Phase I; and the $300 million St. Clair County, Illinois, Metrolink LRT extension, where he has had responsible charge for design, construction, and system start up.

ICE/ISE Manager - Anthony Venturato

Anthony has 40 years of experience in transportation projects including management of large scale transit systems expansion. His experience also includes serving as the FTA project management oversight manager for the $1.5 billion BART SFO project, and as the engineering manager for the CHSRA Los Angeles-to-Anaheim segment EIR/EIS.

The TPZP quality and self-certification approach, which also applies to all subcontractors and third-party entities, is discussed in detail in Section 5.

2.1.3. Small Business Utilization

TPZP shares the CHSRA's commitment to utilize SBs to inspire job creation, business growth, and workforce development opportunities, while delivering a safe, top-quality high-speed train project. Individually, we have unyielding commitments to the growth and development of SB concerns in our communities and on our projects. As a joint venture team, TPZP believes this makes good business sense, as the long-term economic health of California will be enhanced with the participation of SBs in all market segments of the construction industry. We have been and will continue to be very proactive in developing and cultivating relationships with local and regional SB/DVBE/DBE/MB firms.

Table 2-2 includes information regarding the utilization of SB/DVBE/DBE/MB firms for Tutor Perini, Zachry, and Parsons on each firm's four most recently completed projects. All four projects surpassed the established goal.

Another project that TPZP would like to highlight is still in progress, but is relevant to the CAHSR CP1 project in terms of value, size, and the challenging SB revenue goal. The 15.3-mile extension of the Houston METRO light rail system is $1.4 billion project. Parsons is the facility provider in the Houston Rapid Transit Joint Venture and the managing partner of the DBJV. As the facility provider, one of Parsons' responsibilities is the project's SB enterprise utilization. The project SB goal set participation parameters with a penalty for less than $255 million and an incentive for more than $290 million. The lessons learned that follow have produced a very successful template for TPZP to use on the CAHSR CP1 project:

- Senior management commitment and involvement
- Providing ample staffing
- A SB outreach plan targeted to the community to ensure that all interested SB subcontractors and suppliers are identified
- Contracting opportunities are communicated in a timely manner to interested SB firms

Table 2-2: Utilization of SB/DVBE/DBE/MB Firms

Project	SB Goal %	SB Achieved %	Firm T	Firm Z	Firm P
JFK Bay Runway 13R/31L Reconstruction, Queens, NY ($221M)	10	15.9	◉		
Tappan Zee Bridge Deck Replacement, Westchester County, NY ($177M)	8	20.7	◉		
Fairfax County Parkway, Fairfax County, VA ($112M)	25	34.8	◉		
I-94/Mitchell Interchange, Milwaukee, WI ($178)	19	19.5	◉		
Bexar County IH 410, Dallas, TX ($117M)	6	10.3		◉	
SH 130 Segments 5 & 6, Lockhart, TX ($972M)	12.5	12.5		◉	
Loop 12, Dallas, TX ($238M)	10	12.2		◉	
President George Bush Turnpike Section 30, Rowlett, TX ($122)	8	8.5		◉	
Miami International Airport New South Terminal, Miami, FL ($844M)	7	25			◉
The New I-64, St. Louis, MO ($535M)	16	18.6			◉
Mid-City Exposition Light Rail Transit, Los Angeles, CA ($868M)	20	21			◉
Intercounty Connector, Contract B, Baltimore, MD ($561M)	13.3	18.3			◉

- Assistance is available to SB subcontractors so that they can succeed in the work

As of October 2012, there are first- and second-tier SB commitments for $310 million on the Houston Metro Solutions project, with more than $215 million paid out with 22 months remaining until the targeted revenue service date in September 2014. Parsons (Houston Rapid Transit), directly and through its project joint ventures has issued 340 direct contracts, of which 198 are SBs. Additionally, 603 second-tier contracts are in place, of which 377 are with SBs.

2.1.4. Small Business Performance Plan

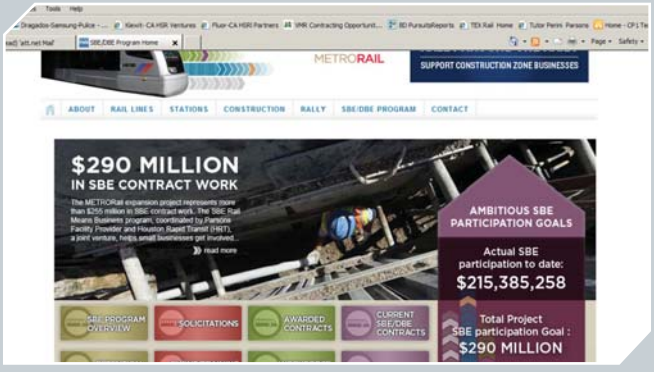
TPZP understands the purpose and importance of the CHSRA's SB Program and fully commits to subcontracting to meet or exceed 30 percent of the total contract price with SB firms (SBs collectively include small business enterprises [SBEs], DBEs, DVBEs, and MBs). This includes a discrete focus on attaining 10 percent DBE participation and 3 percent DVBE participation.

TPZP is a joint venture comprising three companies that have a long track record of meeting SB and related program goals on several significant public works projects, totaling billions of dollars of design/construction. A major factor in that successful track record is establishing and executing a small business performance plan tailored to meet the project-specific SB requirements and circumstances of the owner agency. We will apply the experience from these successfully completed projects to the CAHSR CP1 project. As our policy statement demonstrates, the TPZP principal companies are committed individually, and collectively, to the utilization of SBs on the CAHSR CP1 project.

The TPZP SB Performance Plan (Plan) developed for this project (see full TPZP Plan in Volume 1 – Technical Proposal Required Documents) reflects our commitment to meet or exceed the 30 percent SB, inclusive of 10 percent DBE, and 3 percent DVBE goals and defines our approach, based on best practices of the CHSRA SB Program, to identify, prepare, and contract with SBs. It is TPZP's intent to provide maximum practicable opportunity for SBs to participate in the execution of meaningful work while preserving the highest possible standards of quality, safety, and value for the CHSRA.

To provide the right leadership for this important program and our Plan, TPZP has designated Joe Hernandez, of the LA Group (SB certified), as SB/DVBE/DBE/MB Manager (SB Manager). Joe brings more than 18 years of experience managing SB outreach programs, including DBE programs subject to 49 CFR Part 26, on more than $11 billion worth of public works projects, and he brings excellent relationships statewide with SB organizations, public agency SB administrators, and various SB supportive service entities. Joe will be responsible for developing, implementing, monitoring, and managing the day-to-day operations of the SB program. He reports directly to Steve Pavoggi, our Officer-in-Charge. He will also be a critical connection between our team's senior management and all

The Parsons team established a comprehensive interactive informational website (www.gometrorail.org) for the $1.4 billion Houston Metro Solutions design-build project to support the project and small business utilization efforts.



Policy Statement


TPZP's SB Policy Statement

Our team is committed to meet or exceed the 30 percent small business/ disabled veteran business enterprise/ disadvantaged business enterprise/ microbusiness (SB/DVBE/DBE/MB) goal established for the CAHSR CP1 project. Tutor Perini, Zachry, and Parsons have all exceeded SB goals on large, complex transit projects.

subcontractors, including SB firms. Joe will coordinate with the CHSRA SB Program staff, including facilitating quarterly meetings to report on the progress of the Plan implementation.

With the support and involvement of TPZP senior management, Joe is committed to the following key functions so that opportunities will be available to SB firms on this project:

- Advising the officer-in-charge and project manager/director on SB matters and achievements
- Performing extensive SB outreach through participation at workshops, MB enterprise seminars, trade fairs, and other SB-focused events
- Establishing/maintaining relationships with interested businesses, including SBs, as well as local agencies and business organizations/ associations
- Ensuring compliance with the CHSRA's SB Program requirements and related federal, state, and local requirements
- Providing supportive services to SBs in obtaining management, technical business development expertise, bonding, insurance, lines of credit, and other assistance
- Ensuring that bid notices and requests for proposals are readily accessible and promptly disseminated to the SB community
- Coordinating SB Program meetings and deliverables with the CHSRA, local agencies, and the business community
- Implementing the plan, keeping it up to date with current project circumstances, and ensuring that all TPZP employees and subcontractors comply with the plan and CHSRA SB Program requirements
- Monitoring and analyzing TPZP progress toward meeting goal commitments and making adjustments as necessary to maximize SB participation
- Preparing and submitting monthly and quarterly reports to the CHSRA on plan implementation, including good faith efforts activities and SB participation
- Fostering inclusion of SBs in TPZP solicitation process for design, construction, and other support services

It should be noted that our team has already exercised leadership that demonstrates our commitment to the CHSRA SB Program. It was TPZP that first requested the participation of the CHSRA SB Program staff at our SB outreach events. The CHSRA accepted our invitation and in fairness also offered to support outreach events of the other prequalified proposers. Additionally, the TPZP team brought its key executives (Ron Tutor, CEO of Tutor Perini; Jean Abiassi, COO/President of Zachry; and Takis Salpeas, Senior Vice President Rail Transit of Parsons), to our second outreach event, where nearly 300 participants heard, firsthand, our team's commitment to utilize SBs. TPZP is engaged with the U.S. Department of Commerce/Minority Business Development Agency to identify innovative approaches to raising awareness and participation on the CAHSR CP1 project.

Figure 2-2: SB Solicitation Flow Chart

TPZP Methodology to Achieve the Overall Goal

TPZP will meet or exceed the 30 percent SB goal through a process that began with canvassing the California business community to identify all certified SBs, and those that have the potential to be certified, that can support the scopes of services needed for the project. TPZP recognizes that a key challenge to SB participation on major public works projects is SB awareness of bid opportunities with enough lead time for the SBs to act. To help SBs overcome this challenge, our team has taken the initiative to canvass the California SB community to identify ALL certified SBs, and potential SBs, that provide construction, design/engineering, and other support services and include these businesses in an ongoing communications campaign on how to prepare to do business with the TPZP team and, eventually, on participating in upcoming bid opportunities.

TPZP started by mining the construction, design/engineering, and support services SB firms from the following databases/lists:

- DBE firms from the California Unified Certification Program Database

Table 2-3: Fresno/Madera-Area Organizations Contacted by the TPZP Team

Central California Hispanic Chamber of Commerce, Mark Lozada, President	UC Merced SBDC Network (regional director)
Fresno Area Hispanic Chamber of Commerce, Dora Westerlund, CEO and President	Fresno Economic Development Corporation (board and staff)
Fresno Chamber of Commerce, Al Smith, CEO and President	Madera Economic Development Corporation (board and staff)
Madera Chamber of Commerce, Debi Bray	Community college presidents and staff
Fresno Metro Black Chamber of Commerce, Tate Hill, President	Workforce investment boards (WIBs), Fresno and Madera counties
Fresno County Women's Chamber of Commerce, Keri Bennitt, President	Chris Gallardo, who consults with the Indian tribes
Fresno West Coalition, Keith Kelley, President	Central Labor Council of Fresno, Madera, Tulare, and Kings Counties
Fresno Center for New Americans	San Joaquin Valley Construction Management Group, Marvin Dean
Fresno Business Council, Deb Nankivell, CEO	Trade organizations (including John Hutson from the Building Trades and others)
Bobby Vang (business owner/opinion leader in the Southeast Asian community)	Association of General Contractors, Dave Jones
Small Business Association, Fresno District Office, Carlos Mendoza	Association of Builders and Contractors
Central Valley Business Incubator	

TPZP Successful Outreach Events to Date

TPZP will continue to participate in outreach events targeting small business (SB) firms for a variety of construction-related activities. As of the submission of this proposal, TPZP has participated in 13 events in the Central Valley area and maintains a database of potential subcontractors totaling more than 900 local firms.

- SBE, DVBE, and MB firms from the California Department of General Services Database
- DVBE firms from the CalVet Program Database
- Attendee list from the CHSRA-hosted SB outreach event in Fresno, California, on May 17, 2012
- Attendee list from the CHSRA-hosted SB outreach event in Fresno, California, on September 8, 2011
- Attendee list from the CHSRA-hosted SB outreach event in Los Angeles, California, on April 12, 2011

From these databases, we identified approximately 9,000 SB firms that could potentially provide services needed for the CAHSR CP1 project and have aggregated these listings into one TPZP SB database. About 2,000 of these firms specifically provide construction services. All 9,000 SB firms have been included on distribution for TPZP communications, which helps

SB OUTREACH EFFORTS TO DATE

Over the past 21 months, TPZP has taken many steps to create awareness and opportunities for SBs to become a part of the CAHSR CP1 project and its jobs:

TPZP HELD TWO OUTREACH EVENTS IN FRESNO WITH MORE THAN 500 ATTENDEES.

PARTICIPATED IN 11 LOCAL OR CHSRA SB OUTREACH EVENTS.

ESTABLISHED AN SB DATABASE WITH 9,000 FIRMS TARGETED FOR CP1-4.

PERSONALLY CONTACTED 385 CONSTRUCTION FIRMS IN THE CENTRAL VALLEY.

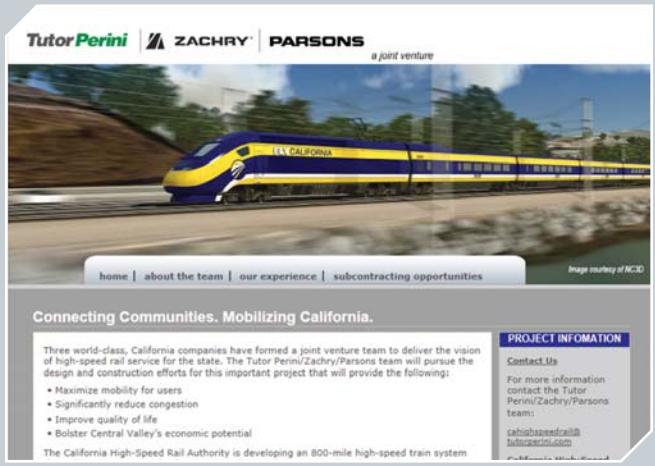
ADVERTISED IN ***THE FRESNO BEE, THE MADERA TRIBUNE, THE BUSINESS JOURNAL,*** AND SMALL BUSINESS EXCHANGE.

UTILIZED CENTRAL VALLEY AND FRESNO ETHNIC CHAMBERS, EDCS, AND SB ORGANIZATIONS.

ESTABLISHED A TPZP WEBSITE WITH SUBCONTRACTOR REGISTRATION.

SIGNED TEAMING AGREEMENTS WITH MANY SB AND LOCAL FIRMS.

TPZP Outreach Website www.tutorperiniparsons.com



raise awareness of how to prepare for opportunities with the TPZP team and other CHSRA high-speed train projects.

In addition, several SB organizations, including a number in the greater Central Valley area, were contacted and requested to assist the TPZP team in disseminating these invitations, with the intent of reaching the local SB community, including the often-overlooked Hmong community. These organizations include the Fresno/Madera-area organizations shown in Table 2-3.

We will continue to use the services of SB organizations to expand our reach into the SB community and to identify local SBs that may be able to provide needed supportive services, such as printing, delivery service, and more. When SBs are identified that express an interest in participating on the project but are not currently certified as an SB, TPZP will assist such businesses with gaining SB certification.

As a result, we have grown our project TPZP vendor database (where SBs register to participate in the TPZP bid package process for the project) to more than 900 SBs, and this list continues to grow through our ongoing communication efforts. Registered vendors have provided TPZP with additional information on the types of services they provide. Those registered vendors that match scopes needed for the project will be invited to participate in the TPZP prequalification process, taking them one step closer to doing business with our team. Prequalified firms are now in position to bid on work packages offered by the TPZP team.

While the TPZP team has implemented a significant outreach program during the proposal stage, TPZP realizes that this will be an ongoing effort. We will continue the public awareness program through and after award

> TPZP's goal is to not only build the experience level of those SB subcontractors used on the CAHSR CP1 project, but to improve the capacity and capability for future work in the Central Valley.

July 25 Fresno Outreach, CEO of Tutor Perini speaking to an audience of 300 representatives of the SB community.

to ensure that SBs are aware of additional opportunities available to them through following CP2-4 procurements. We are regularly issuing TPZP team updates, which are designed to keep SBs aware and interested in the project and in TPZP. This will further expand opportunities for SBs and will help our major subcontractors meet their SB participation levels. The TPZP vendor database will be maintained throughout the procurement of all high-speed train construction packages and will be supplemented with newly certified SB firms on a regular basis.

Early in the proposal process, TPZP established a team website. The intent of the TPZP website is to enhance the advertisement of contracting and procurement opportunities to SB firms and to share information on the team's involvement in local community events to help gain positive attention for the project in the community. Information included vendor registration along with bidder/proposer prequalification criteria/requirements and access to technical assistance resources, such as SB loan programs, bonding assistance programs, and other business development programs.

The website provides an interactive resource where subcontractors can report their interest in the project and provide information on their qualifications. The website is promoted through mailings, emails and newsletters distributed to SBs, business and SB advocacy groups, religious and community organizations, and the news media.

Areas of Work to Be Performed by Subconsultants and Subcontractors

TPZP has developed a complete list of potential subcontractable scopes related to the project.

Regarding design work, TPZP has already engaged teaming agreements with a number of subconsultants for our team. The design subconsultant participation of SB firms currently part of the team, along with their identified work scope ***will exceed the 30 percent goal of the design cost estimate.***

The construction participation is still a work in progress, as work packages, quantities, and final negotiated terms with the CHSRA are still to be finalized. However, Table 2-4 outlines potential construction scopes, which will be targeted for SB participation. Further work has been done to identify general areas of work to be preformed for CAHSR CP1 and applied a specific SB goal to build a plan that will allow TPZP to meet the SB goal of 30 percent

Table 2-4: Potential Construction Subcontract Scopes

Administrative Services/Personnel	Aggregate Suppliers	Archaeological Study
Architectural Specifications	Asphalt Cold Planning	Asphalt/AC Paving
Asphalt/Concrete Crushing	Bridge Joint Seal Assemblies	Bridges/Box Culverts
Concrete Curb, Gutter, and Sidewalk	Concrete Flatwork	Concrete Masonry Unit
Construction Staking/Survey	Contaminated Soil Handling/Removal	Demolition – Building/Site
Dewatering - Wells/Treatment	Earthwork/Excavation	Electrical Work
Erosion Control/Irrigation	Excavation Support	Fencing and Gates
Foundations/Drilling	Guardrail	Hazardous Material Abatement
Hazardous Material Removal	Land Surveying – Right-of-Way	Landscaping/Irrigation
Masonry/Pavers	Material Suppliers – all types	Materials Testing/Inspection
Mechanically Stabilized Earth (MSE) Walls	Metal Fabrication	Minor Concrete/Structures
Miscellaneous Metals/Railing/Stairs	Noise/Vibration Monitoring	Painting
Pile Driving	Portland Cement Concrete Pavement	Post-Tensioning
Precast/Prestressed Concrete	QA/QC Oversight/Inspection	Ready-Mix Concrete Supply
Reinforcing Steel Fabrication/Installation	Roadway/Parking Lot Striping	Signage
Structural Concrete	Structural Steel Fabrication/Installation	Temporary Utilities/Lighting
Trucking/Hauling/Disposal of Material		

(see Table 2-5). SB firms currently committed to TPZP and their respective percentage of the total contract value are shown in Table 2-6.

Ensuring SB Participation

Consistent with Title VI and 49 CFR § 26 best practices, TPZP will break out portions of the work scopes into work items of sizes and scopes to facilitate SB participation. The definition of these work packages will be determined partly through extensive review and the understanding of the more than 900 SB firms that have expressed an interest in working with TPZP by registering through our website. Based on the services and capabilities of SB firms, as determined through our prequalification process, including interviews with SB representatives, our team will specifically design work packages that fit the abilities of the interested SB firms.

These work packages will then be solicited to the contracting community. In some cases, bid packages will be solicited only to SB firms, while other bid packages will be solicited to SBs and other businesses. TPZP has set aside several work scopes that will be targeted directly for SB participation through subcontractors, such as a significant portion of the utilities, paving, demolition, fence, and landscaping requirements. Our bidding process will include a prebid conference to allow interested SBs an opportunity to seek additional information about the work packages up for bid. We will additionally provide a reasonable time frame for bidders, particularly SBs, to respond to our solicitations. We anticipate that our outreach efforts will have also prepared SBs to be ready to participate in our bidding process, but we will continue to offer support as needed to facilitate participation of SBs in the bidding process. This is consistent with best practices regarding gaining SB/DBE/DVBE/MB participation on design-build projects.

Table 2-5: SB Targeted Work Scopes

Divisions of Work	% of Contract	% SB	% Total Contract
Design	7	30	2.10
Quality Control	1	30	0.30
Demolition	3	55	1.65
Utilities/Drainage	5	85	4.25
Earthwork/Grading	10	20	2.00
Trucking	2	50	1.00
Concrete Structures	42	32	13.44
Flatwork/Misc Concrete	0.5	80	0.40
Paving and Improvements	4	60	2.40
Electrical/Mechanical	3	20	0.60
Fence/Guardrail	1.5	60	0.90
Signing/Landscaping/ Soundwall	1	60	0.60
Other/Misc Supply	20	3	0.60
TOTALS	**100.0**		**30.24**

In some cases, SBs may not be in position to participate on the project due to various challenges, such as lack of capacity, inability to meet insurance and related requirements, or other reasons. To address these challenges, TPZP will implement an SB supportive services program, in collaboration with the CHSRA, with the goal of enhancing SB business growth and development to increase their chances at success both on this project and in the marketplace

Table 2-6: Committed SB/DVBE/DBE/MB Subcontractors/Subconsultants/Suppliers

SUBCONTRACTORS/SUPPLIERS		
Firm	**Scope**	**% of Total Contract**
Martinez Steel Corp.	Reinforcing Steel - Furnish and Install	8.58%
Valverde Construction, Inc.	Underground Utilities – Furnish and Install	3.31%
M.A. Steiner Construction	Underground Utilities – Furnish and Install	0.72%
Landavazo Bros. Inc.	Concrete – Furnish, Pump & Place	3.83%
SPER Contracting Corp.	MSE Block Walls – Furnish and Install	1.79%
Dillard Environmental Services	Trucking, Earthwork	1.40%
J. Kroeker, Inc.	Building Demo, Clearing and Grubbing	0.78%
G & C Equipment	Furnish Bridge Steel/Precast Concrete Bridge Units	3.10%
Innovative, Inc.	Flatwork Concrete	0.33%
Cor-Ray Painting Co., Inc.	Structural Steel Painting	0.10%
	SUBCONTRACTORS/SUPPLIERS SUBTOTAL – 23.94%	

SUBCONSULTANTS – COLLECTIVELY 2.17% TOTAL CONTRACT	
SB Certified Firms	**Firms with SB Commitment on Their Scope**
CHS Consulting Group	AMEC Environment & Infrastructure
Citadel CPM, Inc.	Environmental Science Associates
Earth Mechanics, Inc.	Korea Rail Network Authority
Lee Andrews Group, Inc.	Provost & Pritchard Consulting Group
MGE Engineering, Inc.	Psomas
OPAC Consulting Engineers, Inc.	Ruettgers & Schuler Civil Engineers
Precision Civil Engineering	STV Incorporated
RailPros, Inc.	SYSTRA Consulting, Inc.
WKE Inc.	Willdan Engineering
WRECO	
SUBCONSULTANTS SUBTOTAL – 2.17%	

TOTAL – 26.11%*

*Balance to be achieved upon completion of design and procurement of open items.

TPZP has committed SB participation, along with identified scope, to subconsultants, subcontractors and suppliers that equates to 26.1% of the total contract and will exceed the 3% DVBE goal. The balance of the 30% SB goal will be achieved upon completion of design and procurement of open items.

in general. TPZP will collaborate with the CHSRA and various other resources that can assist SBs in increasing their capacity to bid on contract opportunities on the project and to meet the various prequalification requirements, such as bonding and insurance.

TPZP will offer educational seminars to assist SB firms to strengthen their business management capacity in areas such as project management, scheduling, estimating, and more. In these sessions, participants will learn what it takes to compete successfully for opportunities on the project. Initial seminar scopes specifically include the following areas:

- ***SB Certification:*** Joe Hernandez, TPZP's SB/DVBE/DBE/MB Manager, is a former member of the California Unified Certification Program Executive Committee who certified hundreds of SBs during his time there. TPZP will capitalize on that experience by developing a "How to Get Certified" workshop that will help potential SBs navigate the sometimes burdensome certification process.
- ***Bonding and Insurance:*** TPZP will facilitate access to independent bonding and insurance lines by developing a program that includes overviews of insurance, bonding, and selected banks, which will allow

qualified subcontractors to take the next step and become prime contractors. This step will increase control within the SB community and offer a more meaningful participation within the business community without being tied to a specified project or contractor.

- ***Other Services:*** Seminars that address other key areas will be developed in collaboration with the CHSRA, potentially including capacity building, communications, partnering, keys to marketing and negotiations, contract administration, preparing estimates, access to capital, business counseling and training, and how to do business with TPZP and the CHSRA

In addition to providing the above supportive services and access to technical assistance, TPZP may at times determine that certain SBs could bring value to the TPZP team, based on their ability and work record, but the time frame needed to facilitate their meeting our contract requirements through the above supportive services will exceed the window of opportunity on the project. In such cases, TPZP will consider reducing or waiving certain requirements, such as insurance or bonding limits, to enable these SBs to participate. We feel this process is necessary to help our team meet the SB goal for the project

Additionally, TPZP will consider providing financial assistance, in line with SB Program requirements, to better position SBs for success. In other circumstances, the TPZP team may assist SBs in obtaining equipment, supplies, or other needed materials if they cannot otherwise acquire these items. The form of this type of assistance will be unique to each SB firm and will be based on a number of factors, primarily including the likelihood of an SB to succeed if given an opportunity.

TPZP will continually assess the effectiveness of our supportive services efforts, the needs of the SB community, and our ability to successfully contract with SB firms. If needed, adjustments to the supportive services will be made to address specific obstacles identified by our team in SB participation. We will also meet quarterly with the CHSRA to review our outreach and training efforts and welcome input from the CHSRA regarding means to increase the participation of SBs.

Post-Award SB Program Compliance Monitoring

Joe Hernandez, SB Manager, will lead the team's efforts to monitor SB contracts once they have been awarded. Contract compliance monitoring will include, but will not be limited to, the following: (1) establishing and maintaining the integrity of contract compliance files, incorporating contract compliance SB records into the master contract file, and making sure that all SB firms awarded contracts have appropriate SB certification; (2) making sure that appropriate SB utilization plans have been submitted, reviewed, and approved; and (3) making sure that appropriate periodic SB progress reports have been submitted and reviewed and that payments to SBs have been verified and approved.

2.1.5. Approach to Permitting and Jurisdictional Approvals

TPZP recognizes the importance of and has previous experience with an aggressive approach to securing necessary permits and jurisdictional approvals, as the absence of a required permit can have a direct impact on the construction schedule. This project will require a number of permits and approvals from affected agencies and owners. Some of these approvals and permits have been, or will be, secured by the CHSRA as part of the environmental impact statement (EIS). Others will be obtained by the design-build contractor.

Table 2-7: Permitting and Jurisdictional Approvals

Regulatory Agency	Permit/Approval Required	Responsible Party	
		TPZP	CHSRA
BNSF	Right of Entry, Railroad Workers Safety Training	◉	
Cal/OSHA	Permits and Registration Requirements	◉	
Caltrans	Encroachment Permits	◉	◉
City of Fresno	Permits in Master Agreement		◉
City of Madera	Permits in Master Agreement		◉
County of Fresno	Permits in Master Agreement		◉
County of Madera	Permits in Master Agreement		◉
CPUC	Permits and Approvals	◉	◉
CVFPB	Final Encroachment Permits	◉	
Fresno Irrigation District	Permits in Master Agreement (Construction Window Rec'd)	◉	
Madera Irrigation District	Permits in Master Agreement		◉
UPRR	Right of Entry, Railroad Workers Safety Training	◉	
SJVRR	Right of Entry, Railroad Workers Safety Training	◉	

Legend
BNSF – Burlington-Northern Santa Fe Railroad
Cal/OSHA – California Division of Occupational Safety and Health Administration
CPUC – California Public Utilities Commission
CVFPB – Central Valley Flood Protection Board
SJVRR – San Joaquin Valley Railroad UPRR – Union Pacific Railroad

On the $783 million Alameda Corridor Mid-Corridor Trench project, the trench traversed the jurisdiction of six cities plus unincorporated areas of the county, and was mainly built in a major freight rail corridor. The design-build process required negotiating requirements and local preferences, plus obtaining individual permits from every jurisdiction. This significant effort required coordinating with each jurisdiction, as well as the owner, to prevent delays and creating scope creep.

Another example of our team's successful experience with permitting and jurisdictional approvals can be taken from Tutor Perini's $609 million BART SFO Extension project. Both stations included in these contracts were built

immediately adjacent to major shopping centers and included new parking garages plus surface parking and circulation improvements. Extensive agency coordination was required with two counties, five separate cities, SFO, numerous utilities, state and federal environmental agencies, Caltrans and Caltrain. Stakeholders included numerous community, residential and business associations plus the major tenants along the alignment. This coordination was successfully completed and resulted in the project dealing directly with the community with minimal unforeseen impact.

In providing design and environmental planning services for highway, bridge, and railroad grade separation projects in the San Joaquin Valley for more than 50 years, Parsons has developed relationships with a number of agencies and jurisdictions. We have prepared environmental documents for highway projects in Fresno, Tulare, Kern and Stanislaus counties, working with the U.S. Fish and Wildlife Service, the California Department of Fish and Game, the U.S. Army Corps of Engineers (USACE), the EPA, and a number of flood control districts.

As part of the design efforts for San Joaquin Valley projects, Parsons has assisted cities in securing permits, including construction and maintenance agreements with UPRR and BNSF. In addition, we have worked with local utility companies to coordinate the relocation of utilities.

To ensure that necessary permits are secured as needed and on time, TPZP will establish a permit approval task force, led by our Environmental Compliance Manager, Macie Cleary, which will include the design manager, the design-build coordination manager, the utility coordinator, the construction manager, and representatives from the permitting agencies and the CHSRA. Meeting monthly, the committee will track the progress of required permits and will take action, if necessary, to maintain the schedule of their approvals.

TPZP has worked in various environmentally sensitive areas; an example of this was on the $609 million BART SFO Extension. Construction environmental monitoring was extensive, including fugitive dust control, street cleaning, and noise and vibration control (especially next to the hospital). Construction of the aerial portion entailed crossing wetlands with two endangered species, the red legged frog and the San Francisco garter snake. Extraordinary mitigation measures were required, including temporary elevated platforms, so that no construction touched the ground.

The CHSRA is the responsible party for obtaining some of environmental approvals and permits; however, TPZP will also be responsible for some approvals and permits. The permit task force will work as a team to ensure follow through on all approvals and permits. A summary of environmental approvals/permits and the responsible parties are contained in the RFP, Book 3, Part D3. In addition to the environmental permits, there will be agency and jurisdictional permits required. Anticipated jurisdictional permits and approvals are summarized in Table 2-7.

2.1.6. Unique Project Elements, Limits, and Constraints

This project will include a number of unique elements, limits, and constraints that our team has successfully resolved before. A summary of the unique elements, limits, and constraints, with TPZP's solutions to each, is included in Table 2-8. Our team understands these constraints and challenges and has addressed them in our approach, our work plan, our organization and throughout this proposal.

2.1.7. Plan for Packaging and Sequencing Work

Within 30 days of the initial notice to proceed (NTP), we will mobilize and prepare required submittals. Initially, upon receiving rights of entry, hazardous materials and underground utilities will require further field evaluation, as will the coordination with UPRR, SJVRR, and BNSF, especially proposed shoofly with the UPRR.

Multiple teams will expedite all tasks and concurrently develop remediation and/or relocation plans to allow the project to move forward. As buildings and/or properties are cleared by our environmental teams, contingent upon right-of-way (ROW) acquisition, the demolition of structures will take place, where required. As existing utilities are evaluated and their

Figure 2-3: Project Segments

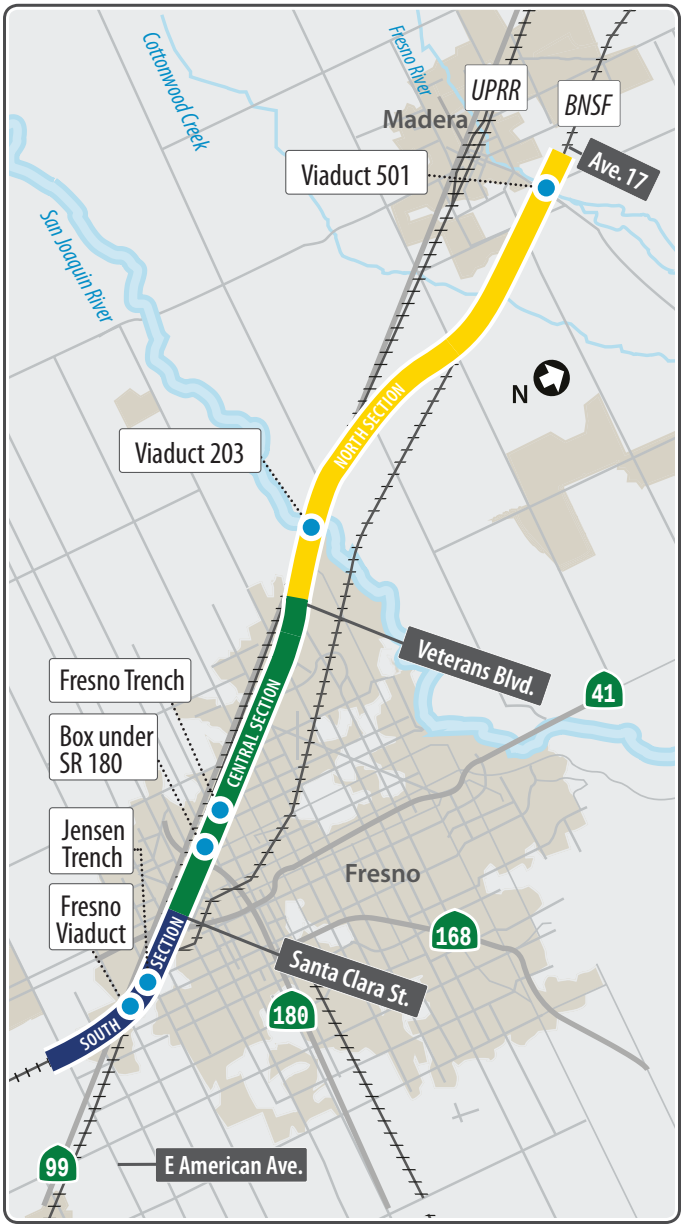


Table 2-8: Unique Project Elements, Limits, and Constraints

Project Elements, Limits and Constraints	TPZP Benefit
Schedule – The schedule, driven by Federal Railroad Administration (FRA) funding deadlines, requires project completion in 54 months.	TPZP has established a schedule that will meet the requirements, and, if needed, will accelerate using early design packages and construction workarounds.
Right-of-way acquisition – Of the 465 parcels, 81 percent are acquired in less than 15 months after NTP. Within 27 months, 98 percent will be acquired. Within 39 months, all but two parcels will be acquired, which will be delivered by November 24, 2016. Although this will have a minimal impact on most locations, critical construction areas will have impacted schedules due to parcel acquisition.	TPZP Project Manager/Director Josh Randall will monitor acquisition and develop scheduling workarounds to allow work to advance as much as possible while the right-of-way process continues.
Utilities – Portions of the project, especially trench sections, will require the relocation of numerous utilities, including 16- and 18-inch gas lines in G Street and between Ventura and Tulare streets in Fresno	Wayne Karlik will serve as TPZP's Utility Coordinator. We will establish an aggressive program to identify impacted utilities and to work with the owners to provide relocation plans.
Railroad coordination – There will be a number of grade separations that will replace at-grade local road crossings with the UPRR. In downtown Fresno, there will be two railroad underpasses at the UPRR that will require construction of a mile-long shoofly. This will require close coordination with and approval from the UPRR. Two underpasses will be built, one at a time, under the SJVRR spur lines near the Dry Creek canal.	From the start, we will work closely with the railroad to secure right of entry and approval of bridge crossings. Mike Ongarth, who was a senior manager with the UPRR, will advise with the railroad issues. Gary Luenenborg, former general director of design with the UPRR will assist in the review of the design of railroad elements. We will expedite the shoofly decision through early design.
Construction noise/vibrations and dust – The project involves dust and demolition impacts.	TPZP will take the following measures: drilling instead of driving, informing the public through outreach efforts, minimizing demolition impacts, controlling emissions and dust by minimizing movement of earthwork and watering the haul roads, and minimizing demolition.
Hazardous materials – Demolition of industrial buildings, particularly as construction occurs in the downtown area, may require the removal of hazardous materials.	Shala Craig, TPZP's Hazardous Materials Manager, will develop a hazardous materials plan to address responses to hazardous materials encountered during construction.
Community impacts – The project will cut through Fresno, and there will be visual and social impacts to the community.	TPZP will work with the City of Fresno and the CHSRA to provide context-sensitive design elements that help to unify the community.
Farm lands – Impacts to farm lands are a concern to farmers at the north end of the project.	TPZP will minimize construction impacts and operations to adjacent farm lands or farm operations. This will include using the alignment itself as an off-road haul road during embankment and structure construction and using temporary culverts, as needed, to maintain drainage flow during construction.
This project does not include systems and trackwork – The CAHSR CP1 project will include guideway earthwork and structures only; there will be no track, trains, stations, systems, or maintenance facilities. There will be a need for flexibility in the design to provide for future components that have yet to be specified.	SYSTRA Consulting, Inc., and Korea Rail Network Authority (KRNA) are part of the TPZP team to ensure future high-speed integration.
Traffic circulation – The project will cross numerous local roads, impacting traffic flow during construction. There are 24 grade separations that will have to be constructed to carry the high-speed train under or over existing cross streets. This will require very close coordination with the cities and counties of Madera and Fresno.	TPZP will develop a comprehensive traffic management plan that will include maintenance of traffic at major roadways. We will also provide an effective public information program to advise the public of traffic restrictions. TPZP's Joe Harake will develop a traffic management plan that will include maintenance of traffic for each of the high-speed train crossings of local roads.
Permitting – There will be a number of permits from affected agencies required for construction of the project. Delays in permits will directly cause delays in the schedule.	TPZP will aggressively identify, monitor, and obtain all permits from local agencies, state agencies, and federal agencies.

Table 2-8: Unique Project Elements, Limits, and Constraints Continued

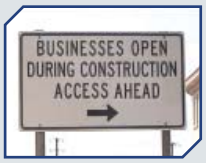
Project Elements, Limits and Constraints	TPZP Benefit
Visual impacts – There are community concerns about the visual impacts that may result from construction of the project.	TPZP will work with the City of Fresno, Madera County, and the CHSRA to incorporate, as required, context-sensitive elements in the design. Also, see the aesthetics discussion in Section 4.6.
Geotechnical – Embankment settlement criteria for high-speed trains allow for very little differential settlement.	TPZP's geotechnical engineers have carefully reviewed potential embankment material and have developed an approach to stabilize embankments and to minimize differential settlement. TPZP will use the international expertise of SYSTRA, which has designed and operated existing high-speed rail systems.
Seismic – The project is in a seismically active area. Minor seismic impacts can have major impacts on the operation and safety of the high-speed train system.	The TPZP structures team has extensive experience in the seismic analysis and design of large viaduct structures and will incorporate the latest seismic design principles in the design of the project. Tom Sardo of Parsons is a recognized expert in seismic analysis and bridge design, with more than 20 years of design experience.
Crossing SR 180 – The high-speed train will cross under SR 180 in a large concrete box. The RFP proposes to jack this very large box under the active freeway and next to a bridge abutment.	TPZP proposes to utilize a jacked box method to reduce the risk of damaging the bridge or the condition of the freeway.
Relocation of 2 miles of SR 99 in Fresno – The freeway relocation design will be performed by Caltrans and constructed as a separately bid contract. This will require very close coordination with Caltrans District 6 to allow integration with this design-build contract.	Doug Slakey of TPZP will provide liaison with Caltrans as we develop the high-speed train alignment and as Caltrans prepares plans for the relocation of SR 99. Doug and Parsons have developed a good working relationship with District 6 design and management staff.
Floodplains – Much of the high-speed train corridor is within or near floodplains, and special attention must be paid to mitigate drainage impacts and to protect the rail line from flooding.	TPZP will analyze all floodplain criteria and will meet all requirements. Our design subconsultant WRECO has extensive experience in hydraulics and drainage in the Fresno area and will support our team in this effort.
Long-lead deliverables – Deliverables such as pump station pumps and steel girders require long lead times.	TPZP will perform early design packages and early submittals.
Long-term operating and maintenance costs – Designs must address life-cycle costs.	TPZP will implement sustainable/innovative solutions. Refer to Section 2.3. Sustainability Plan of this proposal.
San Joaquin River Crossing – This is a major bridge with environmental and access concerns.	We will use construction methods that minimize impacts and will monitor all environmental requirements.

subsequent relocations confirmed and approved, multiple crews will begin relocating the utilities, or will coordinate the relocation by others. As the owner continues to develop the ROW acquisition schedule, flexibility will be our focus.

As ROW becomes available we will maintain three segments, North, Central, and South, to make as much work available to construction as possible. Within these work areas are retained cut sections, requiring support of excavation, vertical structures, and at-grade works, all of which will receive their own specific work forces. Within each segment, we will package the design work to include bridge foundations, superstructures, roadwork, guideway, and utilities.

As work within the rail alignment progresses, portions of surface streets will be demolished and reconstructed. Critical to this process will be the successful relocation of conflicting utilities, maintenance-of-traffic protection, and the provision of continuous access to affected properties. In this regard, we are endeavoring to provide mostly surface detours around the work areas while maintaining access to businesses and residences. Where surface detours are not practical, we will stage construction to minimize potential traffic impacts and/or utilize temporary measures to provide continuous access.

Successful Outreach Efforts to Maintain Business Operations



Tutor Perini went door-to-door on the Alameda Corridor Mid-Corridor Trench project to identify business traffic requirements and adapted specific, temporary measures to accommodate. This outreach effort maintained a thriving business community, with no business interruption claims made against the owner.

Packaging Design Work

Specific elements will be packaged within each project segment, both in design and in construction. The majority of individual grade separations will be designed by SB and DBE subcontractors managed by Parsons. Major viaducts, the SR 180 box, and the Fresno Trench will be designed by Parsons as separate design and construction packages.

By distributing work in this fashion, TPZP can manage the submittal and review process and keep all portions of the project advancing at the same time.

Packaging Construction Work

Within each segment, construction will be advanced in discrete packages to maximize flexibility in the use of crews and equipment. Should there be delay in one area, crews can move to advance construction in another and find workaround solutions.

We anticipate construction to generally advance under the following packages:

- Viaduct 501 & Fresno River
- Ave 15-1/2 - 7
- Viaduct 203 San Joaquin River
- Viaduct 203 at UPRR
- Veterans - Olive
- Fresno Trench
- SR 180 Box
- Stanislaus - Ventura
- Church - Jensen
- Golden State Blvd.
- Fresno Viaduct
- Central - E American

2.1.8. Design Coordination Process

Parsons, as the lead design engineer, has a proven design management/coordination approach based on best practices learned from more than 20 years of experience, successfully completing 64 design-build transportation projects of various sizes and complexities, totaling more than $20 billion, throughout California and the United States.

These best practices include the following:

- Co-location
- Task forces
- Over-the-shoulder reviews
- Design reviews
- Constructability reviews

Regardless of size or complexity, our design team's best practices are fully integrated into each design management component. We have developed common objectives that facilitate working together as partners to ensure that a project is well executed, exceeds expectations, and becomes a recognized success, as was the case on the Tutor Perini/Parsons Alameda Corridor Mid-Corridor Trench project.

Design Organization and Coordination

Our project organization is structured to integrate the project team while maintaining accountability according to technical discipline and function (design or construction); to provide executive oversight; and to provide independence in the key areas of quality, safety, and environmental compliance. Christopher Clark, PE, our Design Manager, and Mark Jurica, our Design-Build Coordination Manager, will ensure successful delivery with this technical discipline/task-force approach. The team has already concluded a task force for the development of design and alternative technical concepts (ATCs) for this proposal.

We will organize the TPZP design team by discipline, with discipline leads for project-wide elements and with production teams preparing designs in three geographic segments: the North Segment, the Central Segment, and the South Segment.

The TPZP design team is California-based, with Parsons' corporate headquarters in Pasadena. Within the state, Parsons has more than 800 transportation engineers (including 400 licensed, professional engineers), planners, and construction managers who are available resources for delivering the CAHSR CP1 project. Our key subconsultants are also California firms and have more than 400 employees. TPZP will co-locate key design disciplines with the design-build coordination staff in a Fresno office. Located near the project site, the design-build team members will interact on a daily basis and be close to construction activities and third-party stakeholders. Co-location encourages daily one-on-one communication, impromptu meetings, over-the-shoulder reviews, and shared access to all project information, which is an essential organizational strategy. Our Design Manager, Chris Clark, will serve as the single point of contact responsible for coordinating with the CHSRA and other stakeholders.

Our staffing level is expected to peak approximately four months after NTP and will continue for about eight months before ramping down. A portion of the design staff will be co-located in our Fresno project office, with special expertise in structures and guideway alignment coming from Parsons' San Francisco, Pasadena, Denver, Seattle, and Salt Lake City offices, and from subconsultant/subcontractors.

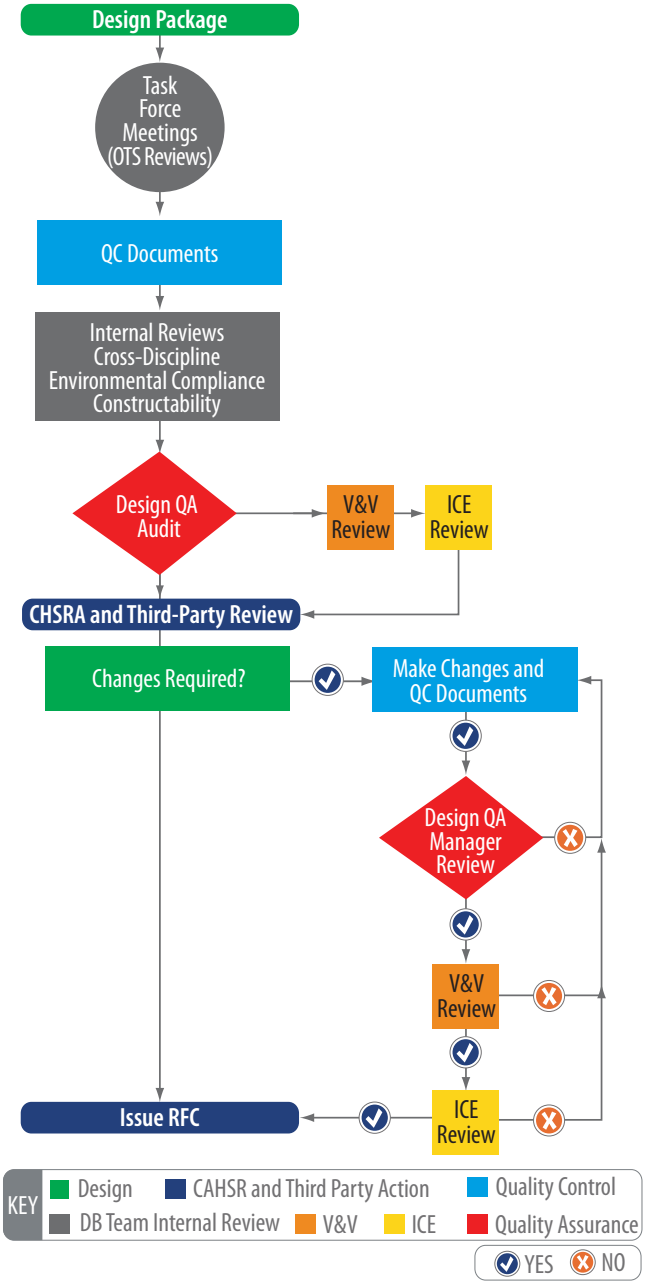
TPZP will continue to lead our weekly task-force meetings, chaired by the discipline leads. The primary focus of these meetings will be schedule, interdisciplinary coordination, owner coordination and input, and stakeholder coordination and input. At the same time, segment managers will provide updates on the status of design production and will identify any issues needing action or resolution.

Task-force meetings will be held to coordinate with third-party stakeholders and the CHSRA throughout the design period and to conduct over-the-shoulder reviews of designs as they are developed. These over-the-shoulder reviews are critical in optimizing constructability and coordination and in avoiding potential future design changes. The task force concept and the use of experienced builders participating in the design development through Mark Jurica, the Design-Build Coordination Manager, have proven to be among the most effective components of an integrated design team.

Task Force Topics

TPZP will regularly discuss schedule, early construction needs, risks, cross-discipline coordination, packaging, plan content and format, constructability, sequencing and staging, quality, and conformance to contract requirements at the task-force meetings.

Figure 2-4: Design Review Flowchart



Design Review Process

A well-planned and implemented design review process is essential to design performance. TPZP will use a formal method for reporting, tracking, and resolving the comments developed by the CHSRA, railroads, local municipalities, and other third parties during design reviews.

Chris will formally structure and document reviews to allow a smooth transition to the next design phase by using a comment form, disposition, and implementation procedure that will allow reviewers to easily determine the actions required and taken. The CHSRA will be invited to attend and participate in every design review. Stakeholder review requirements are included in the contract specifications and will be further described in the QMP.

The QMP will include each level of design submittal (e.g., 60 percent, 90 percent, released for construction, final) and will identify the procedures and responsibilities of each individual involved with the review. TPZP will develop a discipline-specific process flowchart, similar to the one shown in Figure 2-4, for each type of submittal and will program it into project collaboration software to aid in the communication, tracking, and document control of each submittal.

Before submitting a design unit, TPZP will conduct a design review meeting to present the forthcoming review package to the CHSRA. TPZP will describe the design unit and its expected level of completion upon submission, the desired focus of the review, the specific list of information requiring review provided in the package, and specific areas of the design unit that are incomplete. TPZP will discuss participants with the CHSRA and invite other stakeholders as deemed necessary. All submittals will undergo QC review before they are released for review. In addition, each design submittal will be accompanied by and environmental compliance report.

Once comments are received, they will be distributed to the applicable segment managers and discipline leads. Our Design Manager, Chris Clark, will lead the comment resolution meetings.

Maintaining the Design Schedule

Our design-build experience has shown the need for an aggressive, collaborative approach to receiving and resolving stakeholder/third-party comments. Because of the impact on their facilities or communities, we anticipate the cities and counties of Fresno and Madera, as well as Caltrans, will have active roles in the design reviews, and TPZP will work closely with their staffs in the design development process.

2.1.9. Construction Coordination Process

TPZP recognizes that effective construction coordination is critical to the successful delivery of the CAHSR CP1 project. Our team will manage the construction coordination process using best practices as outlined within the project management plan and public involvement plan (PIP), and we will ensure that all internal parties and external stakeholders are well informed of the construction schedule, construction activities, and potential impacts to the public.

This approach will accomplish the following:

- Ensure that CAHSR CP1 project goals are understood and sustained as the top priority focus
- Stimulate creative and innovative ideas among team members
- Facilitate a partnership environment among all stakeholders
- Attain higher quality and safety, promoting cost efficiency and on-time completion

Coordination Methods

Our team will incorporate coordination practices successfully used on other large-scale design-build projects, such as the $783 million Alameda Corridor Mid-Corridor Trench design-build project, the $967 million TxDOT DFW Connector design-build project, and the recently opened $972 million TxDOT SH 130 Segments 5 & 6 project, and we will specifically tailor them

to the CAHSR CP1 project. The TPZP approach will facilitate consistent interactive participation and coordination between team members and the CHSRA through the integration and co-location of the primary project office and secondary project field offices.

As the foundation of TPZP's construction coordination process, our primary project office will be located in Fresno and will house key leaders and decision makers from the designer, DBJV partners, and the CHSRA. The co-location of team members at the primary project office will serve as a catalyst to the necessary construction coordination efforts. In addition to the primary project office, TPZP will establish secondary project field offices within each segment of the alignment. Due to the linear nature of the CAHSR project, secondary field offices within each segment will supplement the coordination requirements of the project and will streamline TPZP construction coordination efforts.

Co-location will facilitate efficient communication and coordination within the design-build team and with the CHSRA, and it will facilitate constructability input during the design phase. CHSRA oversight team members will participate in over-the-shoulder reviews and throughout the design process. In addition to the coordination benefits gained from co-location, our team recognizes the added value of impromptu coordination meetings and the uninhibited sharing of information among the design-build team members and with the CHSRA.

In addition to the aforementioned benefits of daily coordination, the TPZP team members, the CHSRA, and key stakeholders will participate in construction coordination efforts through the following elements of our coordination plan:

Constructability Review Meetings: Effective construction coordination begins during the design and construction phases. Weekly constructability reviews during the design and construction phases will serve as a powerful tool, benefiting all parties. Constructability review teams will include individuals with significant experience throughout the full spectrum of the design-build process, including safety, quality, environmental, design, and construction. The constructability review teams will give specific attention to the community and other key stakeholders. Constructability review teams will include the TPZP construction manager, and superintendents.

Task-Force Meetings: Task force teams established during the RFP phase will continue through the design phase and will be managed by task managers during the construction phase. This integrative process will include weekly informal reviews during the design phase and formal reviews at major design milestones to ensure that all design and constructability issues are identified and resolved. During construction, task-force meetings will serve as key construction coordination venues, to formally review design during construction activities, to review the project three-week look-ahead schedule, to facilitate stakeholder and third-party coordination, and to develop action items. Task-force meetings will also include status updates to other critical project-related issues.

Project Scheduling Meetings: The CAHSR CP1 project schedule will be an essential tool in facilitating construction coordination. Weekly, TPZP will conduct project scheduling meetings. TPZP will accurately track the progress of the project, facilitating our ability to manage the design and construction. Construction coordination requirements and efforts will be the primary discussion points of this meeting.

Document Control: The TPZP team will utilize an electronic document management system (EDMS), housed on a dedicated server, for all project-related coordination documents. The secure EDMS software will provide access to team members and will facilitate the sharing of coordination documents, ensuring that the most relevant and current information is readily available.

Coordination Personnel

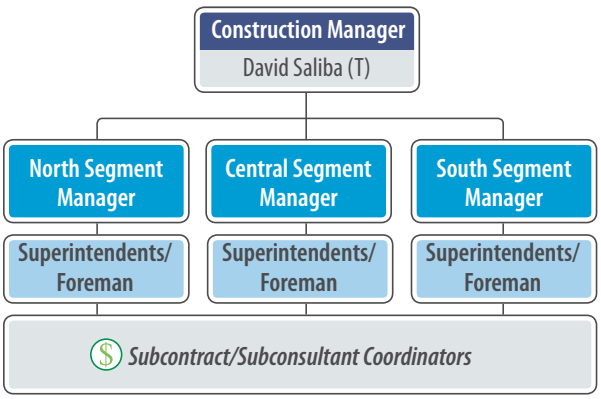
As Construction Manager, David Saliba will have general oversight and accountability for the construction of the project. See Figure 2-5. Directly reporting to David, TPZP will employ segment managers (North Segment, Central Segment, South Segment) who are responsible for the construction activities specific to each segment. Segment managers will be responsible for the daily operations within their respective segments. Segment managers will serve as the first line of decision-making regarding any internal disputes that may arise among segment teams. Within each segment, superintendents will be assigned and will be responsible for specific scopes of work. Foremen will be assigned to specific work crews and will be responsible for the completion of specific scopes of work. In addition to the traditional construction management positions, TPZP will employ subcontract/subconsultant coordinators as relevant members of the construction management team. Subcontract/subconsultant coordinators will be assigned to specific subcontractors/subconsultants (subs), and they will assist with communications, scheduling, required documentation/reporting, training, and any matter requiring immediate resolution.

Value-added positions, such as Utility Coordinator (Wayne Karlik), Railroad Advisors (Michael Ongerth and Gary Luenenborg), Survey Coordinator (Jack Gilbert), and Design-Build Coordination Manager (Mark Jurica), will be instrumental to the successful delivery of the project. Each of these individuals has subject-matter expertise and will be supported by additional coordination staff members.

Subcontractors/Subconsultants and Vendor Construction Coordination

Subs and vendors are just as critical to the successful delivery of the project as TPZP management and resources are. Subs and vendors will be included in every aspect of the TPZP construction coordination processes. These respective team members will maintain an active presence during the advancement of design, will be present during task force meetings, and will be actively engaged during project scheduling meetings. Where

Figure 2-5: Construction Coordination Organization



TPZP will coordinate construction activities with the CHSRA on a daily, weekly, and monthly basis to ensure the prompt and successful completion of the project.

appropriate, key sub decision makers will co-locate with the TPZP team at the relevant project field offices.

In addition to all TPZP staff, all subs will be required to successfully complete the prescribed project-specific orientation training, which will include a thorough review of site-specific safety, quality, environmental, community relations, traffic management, and other project rules and requirements. This training will serve to quickly integrate the subs and vendor personnel into the construction coordination processes.

Subcontract/subconsultant coordinators are value-added positions, each assigned to a specific sub. TPZP sub coordinators will assist with the construction coordination of subs and vendors. Serving as a front-line support system for each sub and vendor, sub coordinators will provide direction and assistance with scheduling, required documentation/reporting, temporary/permanent material ordering, as-built drawing requirements, training, and other relevant matters requiring immediate attention. Sub coordinators will monitor and document subs' progress daily.

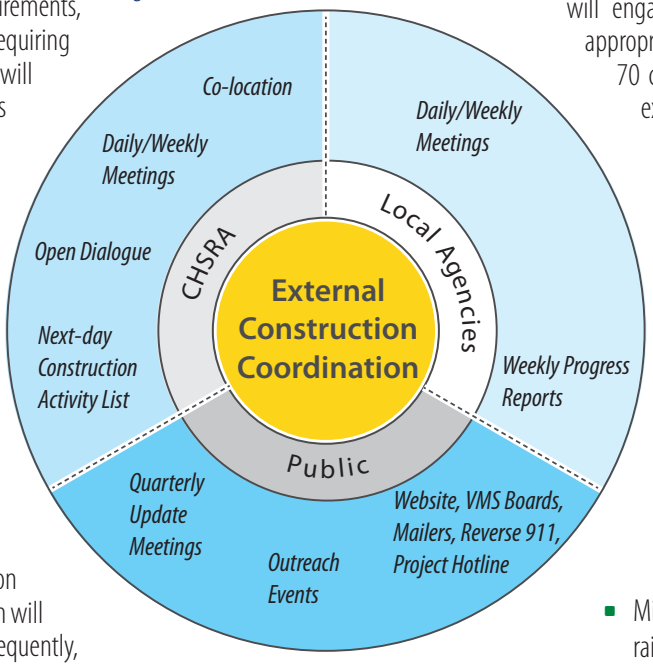
CHSRA and Agency Construction Coordination

As the California-based team, TPZP has a longstanding, successful working history of coordinating with Caltrans, the USACE, Cal/OSHA, the City of Fresno, the City of Madera, the County of Fresno, and the County of Madera. An example of this working experience is demonstrated by the award-winning Shaw/Marks Grade Separation project for the City of Fresno. The TPZP team will coordinate with the CHSRA and others frequently, and as required. Our team will regularly coordinate in a professional and collaborative manner that continues to build on our existing working relationships. Serving as the primary point of contact between TPZP and the CHSRA, the Project Manager/Director, Josh Randall, will coordinate with his CHSRA counterpart. Construction coordination efforts will be a primary subject during the weekly owner's progress meeting and the prescribed formal documentation and reporting procedures.

Macie Cleary, ECM, will identify and manage all required permits. Before NTP 1, Macie will develop a thorough matrix of required permits and will develop an action plan for each specific permit required. The matrix will be divided by discipline and will identify the specific authority having jurisdiction, and it will provide for any permit updates or required inspections. The matrix will serve as a basis to load permit activities into the project schedule, so permits can be tracked and progressed accordingly.

Co-location of the project field offices will allow the CHSRA, its consultants, and the TPZP team to coordinate face to face, daily. TPZP will conduct regular coordination meetings with the CHSRA and will invite its consultants and other governmental agencies to the meetings, as appropriate, in an effort to coordinate and communicate various project aspects and to facilitate interaction and integration with the CHSRA and stakeholders.

Figure 2-6: External Construction Coordination



Utility Owner and Railroad Construction Coordination

Railroads: Members of the TPZP team have constructed, owned, and operated rail facilities and have built numerous projects in and around existing Class I railroads. These efforts require close coordination and interface with railroad owners, including the UPRR, SJVRR, and BNSF. As a railroad owner and operator, Zachry intimately understands the interface, safety, and administration requirements from a railroad owner's perspective.

As value-added positions, TPZP will employ Michael Ongerth and Gary Luenenborg, as Railroad Advisors. As Railroad Advisors, Michael Ongerth and Gary Luenenborg will engage in railroad coordination efforts as appropriate, and will leverage their more than 70 combined years of railroad coordination experience. Michael and Gary will advise regarding railroad scheduling, construction sequencing, construction coordination, and negotiations.

Following our experience gained on the BART SFO Extension and Alameda Corridor Mid-Corridor Trench design-build projects, our team will coordinate and interface with railroad companies using the following approach:

- Engage in early and regular coordination with railroad companies
- Minimize work within the restricted railroad ROW
- Use ROW entry agreements based on the experience gained in previous design-build projects
- Use qualified personnel, including Michael and Gary, with experience building in and around railroads

Utilities: As Utility Coordinator, Wayne Karlik will serve as the primary point of contact and have primary responsibility for the effective coordination between TPZP and each franchise and municipal utility owner. Wayne has extensive utility coordination experience and will be supplemented by additional utility relocation coordinators.

Utility owners will have a presence during TPZP constructability review meetings, task-force meetings, and project scheduling meetings. Utility coordination efforts and requirements, construction scheduling, and construction sequencing will be discussed during these meetings. Separately, a weekly utility coordination meeting will be held to specifically address the construction coordination requirements of all utility relocations.

Throughout the project, we intend to interface and coordinate with the existing utility companies through the following methods:

- Engaging in regular coordination with utility companies
- Using our master utility matrix to manage utility conflicts
- 3D modeling of utility locations to identify and avoid conflicts
- Proactively using master agreements

Third-Party Construction Coordination

TPZP will employ Edgar Gutierrez as the Public Involvement/Stakeholder Manager. Edgar will serve as the single point of contact for third-party stakeholders and will engage them early to educate each stakeholder about the project requirements. Edgar will facilitate construction coordination efforts with each third-party stakeholder through a fully developed PIP. Edgar will schedule one-on-one meetings with affected stakeholders as appropriate, apprizing them of the construction schedule, construction sequencing requirements, potential construction impacts, and TPZP mitigation measures for each anticipated impact.

2.1.10. Meeting the Environmental Mitigation Requirements

Environmental Compliance

Our approach to successful project completion is to ensure that construction proceeds on schedule while the team maintains compliance with all mitigation measures, project design requirements, and permit conditions. This requires the timely implementation of environmental mitigation requirements and ongoing coordination with federal, state, and local regulatory agencies and with the DBJV team. TPZP will accomplish this by coordinating the mitigation and permit requirements with project design before final construction scheduling so that all construction and mitigation tasks occur in sequence and without delay. Critical environmental issues for this project involve plant and animal species of concern and hazardous waste.

TPZP has designated Macie Cleary as the ECM. Her primary responsibility will be to coordinate with TPZP, regulatory agencies, the CHSRA, and with all environmental and construction monitors. Macie brings 25 years of experience in environmental management and mitigation monitoring for design-build projects. In addition, she has negotiated permits with resource agencies. Recently, she implemented permit conditions for wildlife agencies during the construction of the SR 241/SR 261/SR 133 toll roads in Orange County, California. Macie will be responsible for the fulfillment of all environmental compliance requirements, their scopes, and their schedules. As a key element of her responsibilities, Macie will maintain a detailed matrix for each mitigation measure and permit requirement so that each can be coded and tracked during design, preconstruction staging, and construction.

Environmental Mitigation Efforts

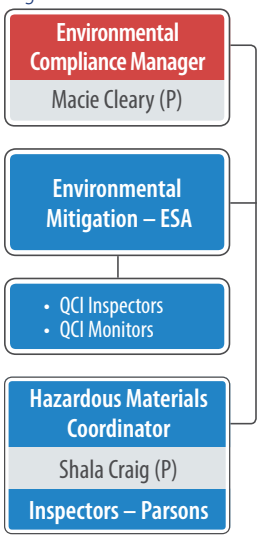
Under the direction of Parsons' environmental specialists, this elderberry bush, home to the endangered valley elderberry longhorn beetle, was relocated to a revegetation site near French Camp, California. It was growing on the proposed alignment of a major new freeway in Bakersfield.

In her role as ECM, Macie will manage the environmental organization, as shown in Figure 2-7. She will lead mitigation monitoring and the identification and treatment of hazardous materials. As discussed in the Section 5 of this proposal, she will have a QA role in these areas. Environmental Science Associates (ESA) will provide environmental support as a subcontractor, under the management of Macie, and will provide Fresno-based inspectors/mitigation monitors during construction.

Before final construction scheduling, Macie will coordinate with the design team to ensure that mitigation measures are incorporated early in project planning, particularly those that could affect or be affected by the construction process. Of particular note are seasonal biological resource measures that could restrict construction scheduling, as well as construction restrictions that apply to biological and hydrological resources. Examples include requirements to avoid vernal pools between October 15 and April 15; to avoid nesting birds during the breeding season, generally February 1 – August 15, and for burrowing owls between February 1 and August 31; and to restrict the excavation and installation of pipelines, conduits, and utility lines during the flood season. These and other restrictions have been considered in designing the construction schedule, which will reflect and adhere to such seasonal limitations.

As the ECM, Macie will work closely with the construction team in determining the areas planned for construction activity so that exclusionary mitigations are established before surface-disturbing activities. Macie will ensure that environmentally sensitive areas are designated on all contract and construction drawings and protected by high-visibility orange construction fencing staked in the field by the biological monitor.

Figure 2-7: Environmental Organization



Macie and the construction team will prepare a construction/mitigation management plan (CMMP) that will include the location, description, and schedule of construction activities; location, description, and schedule of mitigation activities; personnel contact list; administrative procedures; list of deliverables; and other information that may be pertinent to the overall success of the project. At the same time, Macie will

ESA Environmental Science Associates – Mitigation Monitoring

Based in California, with a staff of 300 professionals, Environmental Science Associates specializes in environmental planning, technical studies, permitting, and compliance monitoring. The firm will be a key member of the TPZP team, reporting to Macie Cleary, our ECM.

maintain compliance with all mitigation measures, design requirements, and permit requirements to the satisfaction of the regulatory agencies. The CMMP will be a working document; it will be updated as necessary and used as a handbook by all project participants and subconsultants. In addition, a detailed status report will be prepared and distributed monthly, and an action plan will be prepared and distributed twice monthly. This plan will identify upcoming tasks, the responsible party(ies), and required completion dates.

In addition to environmental compliance, adherence to the project schedule will be a major focus for Macie. Schedules will identify key construction and mitigation activities to ensure that project compliance progresses efficiently and with the concurrence of environmental resource agencies. Macie will monitor compliance activities for each segment of the project and each resource area (biological resources, hazardous materials, hydrology, etc.). Macie will also identify issues that need to be resolved; ensure that all agency concerns are addressed in a timely manner; and proactively coordinate with the resource agencies, the construction manager, and the environmental team. Macie will identify potential issues and take early corrective action to mitigate the consequences.

As the ECM, Macie will maintain frequent communication with the construction team to review the project schedule, decision points, data requests, issues, and actions. Macie will conduct environmental management meetings with the environmental team and the construction manager to review project progress and to concur on scheduled actions for each specific element of construction and environmental compliance. This process will enable team members to understand project issues and potential schedule effects so that delays, design changes, and surprises are minimized or eliminated.

Species of particular interest include, but are not limited to, the San Joaquin kit fox, the blunt-nosed leopard lizard, the California tiger salamander, Swainson's hawk, the American badger, and the valley elderberry longhorn beetle. TPZP will oversee biological resources mitigation and permit requirements, specifically preconstruction surveys, species protection during construction, and overall compliance.

ESA is an established environmental firm with extensive permitting and construction monitoring experience. ESA has supported hundreds of linear infrastructure projects in the Central Valley, including several multiyear projects. The ESA environmental program management team maintains positive relationships with the CHSRA and the regulatory agencies participating in this project.

Only personnel who have completed their environmental training will be admitted into construction work limits. This restriction will be strictly enforced by the construction manager, through the foremen in the field, and by the ECM, Macie Cleary.

The mitigation compliance effort will require qualified personnel in the field on a full-time or part-time basis throughout project construction. TPZP will provide a variety of professionals who are experts in biological resources, hazardous materials, air quality, hydrology, archaeology, noise, and other environmental resources. These professionals will participate in the required Worker Environmental Awareness Program. This program instructs construction and other on-site personnel in the proper procedures for dealing with natural resources and environmental compliance requirements. Instruction will include, but not be limited to, regulations and project permits, identification and valuation of special-status plant and wildlife species, the need for exclusion zones, and hazardous substance spill prevention with containment measures and penalties for noncompliance. TPZP will ensure that all field personnel receive the mandatory training for environmental requirements before starting work.

TPZP will ensure that all field personnel receive the mandatory training for environmental requirements before starting work.

Hazardous Materials

Hazardous materials are noted along the alignment, especially within the city of Fresno. TPZP has designated Shala Craig, Ph.D., as Hazardous Materials Coordinator. Shala has more than 20 years of experience managing hazardous waste identification and remediation projects. These include identifying exposure and risk associated with implementing hazardous waste management programs, plus activities to manage asbestos-containing materials and lead-based paint. Based on hazardous waste information provided in the environmental documents, TPZP conducted additional studies to identify the approximate locations and extent of hazardous waste, asbestos, lead-based paint, and contaminated soils within the alignment. Shala will provide support regarding hazardous materials that may be encountered during construction, and she and the inspectors will report directly to the ECM, Macie Cleary.

Hazardous waste sites identified as being partially or completely within the alignment include three in CP1A, six in CP1B, and four in CP1C. Of these, five are medium-risk and eight are high-risk sites. The TPZP asbestos

study identified residential and commercial structures located partially or entirely within the alignment that are likely to require asbestos abatement. Of these, 126 are in CP1A and 110 are in CP1B and CP1C combined. These structures also are assumed to contain lead-based paint. Soils potentially contaminated by railroad and/or vehicular residue and agricultural pesticides were identified along most of the 29-mile alignment, adjacent to existing agricultural cultivation and roadway and railroad corridors. Effective measures to deal with hazardous materials under consideration include mixing and reuse in fills and in-situ treatment. For these and other issues, on-site surveys will be conducted in accordance with mitigation and permit requirements, and they will be overseen by Shala and regulatory agencies.

2.1.11. Utility Coordination Process

As with all major projects, utility coordination is crucial. TPZP's Wayne Karlik will take the lead in coordinating the process among all parties involved, and he will be responsible for the timely coordination and relocation of all affected utilities. In this role, he will be supported by Utility Design Coordinator Fred Garza and task force discipline leads in each segment. Wayne will also work to ensure that proper agreements and required design and documentation are completed before and during construction. He has more than 40 years of experience in the construction industry, including working with land management individuals assigned by utility companies, and has successfully managed the coordination of utility relocations on several multimillion-dollar projects. TPZP's experience includes the $609 million BART SFO Extension; the $783 million Alameda Corridor Mid-Corridor Trench project; and systems engineering and integration for 10 rail transit extensions in a design-build environment.

While the master agreement will address most of the process for agreements with utility companies, other agreements will also play a role. Existing franchise agreements, licensing agreements, and consent to common use agreements may also be employed as part of this project once final design is completed. TPZP will be working, with the CHSRA having jurisdiction, to ensure that the agreements needed with each utility company are in place before any relocation, removal, or abandonment. Open communication with each utility company will be critical to ensure that this process is seamless and timely with respect to keeping to railway construction schedules and allowing utility companies ample time to complete relocations. Meetings with Pacific Gas and Electric (PG&E) and discussions regarding the master agreement have already occurred.

The Alameda Corridor Mid-Corridor Trench project involved five local jurisdictions and more than 50 utility companies requiring the development and implementation of MOT plans, and relocation or protection of approximately 1,000 utilities that crossed over, under, or through the trench.

TPZP's open communications process has enabled a multitude of California projects to be completed in much shorter time frames, similar to the $780 million San Joaquin Hills Corridor project, which was completed 3 months ahead of schedule. This includes bringing both agencies and utility company representatives together early in the project. By scheduling utility coordination meetings with an inclusionary mindset, all parties are encouraged to voice their desired outcomes. These meetings forge relationships with the entities involved and promote the use of single points of contact. Our dedicated coordinators will serve as our conduits to third parties and will proactively initiate clear outcomes and resolutions.

The utility companies involved include AT&T, Comcast, Kinder Morgan Petroleum, PG&E, Sprint-Nextel, Level 3, tw telecom, and Verizon. The types of utilities include fiber-optic lines, overhead television lines, petroleum pipelines, overhead and underground electric transmission and distribution lines, and natural gas lines. Other associated utility adjustments include manholes, handholes, pull boxes, vaults, cabinets, pedestals, valves, guy wires, duct banks, direct buried lines, inner duct, and casings.

TPZP enables synergies by discussing the proposed roadway/railway plans and allowing for detailed discussions regarding installations, removals, and relocations. Through both office and field meetings, utility coordination is properly addressed, and resolutions are planned, approved, and scheduled with all other entities considered. This creates a win-win mentality and allows for expedited time frames. It also, in many cases, reduces costs by finding the most efficient solutions on both underground and overhead utilities. Utility companies are motivated to work together through joint construction practices after discussing desired outcomes once the roadway/railway plans are proposed and scheduled construction is outlined. Contact has already been made with utility companies and agencies involved on the CAHSR CP1 project, and the process of identifying affected utilities has begun.

There are numerous utilities that will have to be adjusted or relocated along the alignment to allow construction of the high-speed train line. The most significant are 16- and 18-inch underground PG&E gas lines at G Street and between Ventura and Tulare streets in Fresno. Several high-voltage

Table 2-9: Anticipated Utility Work Locations

Agency	Work Locations
City of Fresno Water	24
City of Fresno Sanitary Sewer	25
City of Fresno Fiber Optic Plant	1
Fresno Metropolitan Flood Control District	31
Fresno Irrigation District	7
Madera County Irrigation District	9
Comcast	9
Kinder Morgan	15
Level 3	2
PG&E Power	52
PG&E Gas	21
tw	2
Other Owners	21
Chevron	4

transmission lines cross the alignment, but a survey is required to determine if the lines will encroach on the future high-speed train clearance envelope. A summary of the anticipated utility work locations is contained in Table 2-9

2.1.12. Railroad and Other Third-Party Coordination

In its 29-mile length, the CAHSR CP1 project impacts a number of stakeholders with property or facilities that will have a crucial role in the success of the project. These include state and local agencies, public and private utility owners, railroad companies, and regulatory agencies.

Coordination and liaison with these third parties during design and construction will be a significant effort for the CHSRA and TPZP. We have assigned Edgar Gutierrez to serve as the TPZP Public Involvement/ Stakeholder Manager, and he will have overall responsibility for coordinating our efforts with affected third parties, as well as with the public. Edgar will be based in our Fresno project office, and he will work closely with the TPZP design-build staff to identify and understand issues that affect third parties. Stakeholders in the project fall into three general groups: Caltrans, railroads, and regulatory agencies.

Caltrans

Caltrans will be a special partner in the CAHSR CP1 project, as it has facilities that will be impacted by the design-build effort, and it will be responsible for the design and construction of a 2-mile-long relocation of SR 99 between Clinton and Ashland avenues. The TPZP team is ideally suited to coordinating work with Caltrans. For the past six years, Parsons and Caltrans District 6 have been collaborative partners in the $1.25 billion TRIP/ Bakersfield Program Management contract, which includes projects on SR 99, SR 58, and SR 178.

While Caltrans will be responsible for the design of the relocated freeway, TPZP will design the high-speed train alignment immediately adjacent to the freeway. Coordination of the design elements will be very important, and the TPZP team brings an understanding and knowledge of both high-speed trains and District 6 procedures, policies, and staff to facilitate the concurrent design efforts.

Railroads

The high-speed train alignment will parallel portions of the UPRR and BNSF tracks within the project, and there will be a number of railroad grade separations with local streets. The CHSRA has executed memoranda of understanding (MOUs) with both UPRR and BNSF railroads in regards to the high speed rail project. In addition, a draft Engineering and Construction Agreement between the CHSRA and the UPRR has recently been prepared.

Michael Ongerth will serve as TPZP's Railroad Advisor in coordination with the railroads. Michael is experienced in all aspects of railroad operations, planning, and agreements. He has worked in a variety of positions with Class I railroads (Southern Pacific Transportation Company and the UPRR), including superintendent; general manager of passenger operations; assistant vice president system intermodal operations; assistant vice president operations; vice president strategic development; and general director of merger implementation, joint facilities, and passenger operations.

Parsons is co-located with city, county, councils of governments (COGs), and Caltrans District 6 stakeholders on the $1.25 billion TRIP/Bakersfield Program Management.

Michael will be assisted by Gary Luenenborg, who has joined Parsons after retiring from a 41-year career at the UPRR. Most recently, Gary served as general director design, reporting to the assistant vice president, engineering, in Omaha, Nebraska. He was responsible for the design and permitting of all new construction projects on the UPRR system, including track, bridges, and other facilities, and for the development and structures design for the UPRR's annual bridge maintenance and replacement program. Gary will provide design guidance for the TPZP team regarding railroad bridge design elements, shortening the required review time by the railroad.

In addition, TPZP will utilize the specialized railroad expertise of RailPros, Inc. and Ruettgers & Schuler Civil Engineers. Southern California-based RailPros provides railroad planning and engineering services for commuter and freight railroads, and Bakersfield-based Ruettgers & Schuler has teamed with Parsons in the design of 10 railroad grade separations with the UPRR and the BNSF in the San Joaquin Valley during the past 30 years. John Schuler

Bakersfield 7th Standard Road/UPRR Grade Separation

Parsons and Ruettgers & Schuler designed the 7th Standard Road/UPRR Grade Separation, which was completed in 2010. In this construction photo, the crossing gates of the previous at-grade crossing await removal after traffic was diverted to the new overpass. The project also included reconstruction of the adjacent SR 99 interchange for Caltrans District 6.

of Ruettgers & Schuler will serve as a liaison with the California Public Utility Commission (CPUC) for CPUC approval of the grade separations.

The CAHSR CP1 project primarily impacts the UPRR where the high-speed train alignment and local roads will pass over and under the UPRR track. From our experience with numerous UPRR and BNSF grade separations and from a review of the draft Engineering and Construction Agreement between the CHSRA and the UPRR, we understand the railroads' requirements and expectations. The principal requirements include the following:

- Safety is of critical importance. In addition to currently trained employees, TPZP will ensure that all employees and representatives of TPZP who are expected to be physically within the railroad ROW are safety-trained and certified in railroad safety and railroad security awareness, as well as in the FRA's Roadway Worker Safety Training Plan.
- The railroads grant permission for right-of-entry (permit) for all work adjacent to or on UPRR ROW. This will be obtained by TPZP.
- Except as may be permitted in UPRR-approved final plans, at any location where the centerline of the CHSRA's tracks will be designed to be 102 feet or closer to UPRR's property, the CHSRA must design, construct, and maintain intrusion barriers between the CHSRA's tracks and UPRR's property.
- Unless otherwise approved by the UPRR, work elements must clear span the UPRR's ROW and be designed to permit the CHSRA access for inspection, maintenance, repair, and renewal without the CHSRA needing to enter UPRR's property.
- The CHSRA will provide the UPRR with the preliminary engineering documents and with the Baseline Design Report and the UPRR will provide comments within 45 days.
- TPZP and the CHSRA will provide the UPRR with 60 percent and 90 percent design plans. UPRR will provide the CHSRA with approval of, or written review comments on, the final plans within 30 days of receipt.
- All shoring and falsework plans and calculations will be submitted to UPRR for approval. UPRR will provide approval or written review comments on such methods, procedures, plans and calculations. The UPRR will approve or respond within 30 days.
- At the conclusion of work TPZP will provide as-built drawings and photos of the design to bid process.

Regulatory/Resource Agencies

Although they do not own facilities, regulatory and resource agencies can directly influence the schedule and the cost of the project. Through the approval process and the issuance of required permits, these third-party agencies have specific interests and agendas, and the TPZP design-build team will work with the CHSRA to maintain close coordination with all of them. See Table 2-6.

Macie Cleary will be TPZP's ECM. Recently she oversaw mitigation monitoring for the $780 million San Joaquin Hills toll road in Orange County.

In managing transportation and infrastructure projects in California and in the Central Valley for more than 50 years, TPZP has developed close working relationships with these federal, state, and local agencies, and we will put this experience to use, keeping the project on schedule and within budget.

2.1.13. Draft Traffic Management Plan

Along the 29-mile length of the project, the high-speed guideway will be grade separated from all existing roads with new underpasses or overheads. As planned, there are 9 roadway/high-speed train overpasses in the north segment, 10 roadway/high-speed train overpasses and 2 underpasses in the central segment, and 3 roadway/high-speed train overpasses in the southern segment. Constructing these 24 crossings will require provisions for the maintenance and protection of traffic on local streets.

Temporary Traffic Control Plan

As required, TPZP will prepare a temporary traffic control plan for each phase of the work in accordance with the requirements of the California Manual of Uniform Traffic Control Devices and will request approval of the plan from each affected agency. The plans will include detours and traffic diversions for each phase that might be applied, proposed traffic control devices, provisions for pedestrian and bicycle traffic, temporary traffic control devices and signs, flagger training, qualifications and supervision, anticipated impacts on local business, and parking disruptions.

> Joe El Harake will serve as TPZP's Traffic Control Manager. Joe has more than 28 years of highway design experience, including 23 with Caltrans. He is recognized as an expert in geometric design and in the Caltrans Design Manual.

Agency Requirements

The CHSRA has established master agreements, which are included in Book 3, Part D, Section 1, with the City of Fresno, the County of Fresno, the Fresno Irrigation District, the Fresno Metropolitan Flood Control District, Madera County, and the Madera Irrigation District, some of which specify requirements for traffic control during construction.

Specific requirements for maintaining traffic during construction are specified in the master agreements. For example, the County of Fresno requires the following (Book 3, Part D, Section 1, Fresno Master Agreement):

- Minimum one 12-foot lane during construction, with no delay greater than 15 minutes. Two 12-foot lanes all other times.
- Traffic management, haul routes, and detouring plans must be approved by the county public work's director before closing any crossing.
- Crossings shall remain opened to the greatest extent possible during the construction of facility work, and at no time will two consecutive crossings be closed.

- All off-site detours will utilize only public roads that are paved and centerline-striped and in good repair, suitable for the volume of traffic anticipated.

The City of Fresno also requires the vehicular traffic plan to address emergency access during construction.

TPZP Approach

Specific traffic control plans will be developed for each roadway crossing, tailored to the site work to be prepared and to the responsible agency's requirements. Depending on the site, there are four methods to carry traffic through construction.

Centered Alignment with Detour: The roadway alignment remains the same as that of the existing at-grade crossing, and an offset detour is constructed to carry traffic while the at-grade crossing is removed and a grade separation is constructed at the same location as the existing at-grade crossing. When complete, traffic is shifted to the new overpass, and the detour is removed.

Shifted Proposed Alignment: The new roadway alignment is offset from the existing at-grade crossing, and traffic remains on the existing alignment while a new overcrossing is constructed to the side. When this construction is complete, traffic is permanently shifted to the new alignment, and the existing grade crossing is removed. A portion of the old roadway may remain to serve remaining properties.

Centered Alignment without Detour: The new roadway alignment remains the same as that of the existing at-grade crossing, and the grade separation is constructed in halves. Traffic is first carried on a narrower portion of the existing roadway while the bridge and a portion of the approach embankment is constructed. Traffic is then switched to the completed half of the bridge while the second half is constructed, and the remaining at-grade crossing is removed. When the second half of the bridge is complete, traffic is shifted to the full bridge.

Underpass with Shoofly: Before constructing a new roadway under the railroad, train traffic must be removed at the underpass location. This is accomplished by means of a shoofly, which detours track around the site during the excavation and construction of the underpass and the closure of the roadway around construction. This is the case with the construction of the Ventura Street and Tulare Street UPRR underpasses, as discussed in Railroad Coordination, which follows. Parsons has designed and coordinated the installation of numerous railroad shooflies for underpass construction in California, such as for the Highland Springs underpass in Banning and the Calloway Drive underpass in Bakersfield. TPZP will construct and grade the shoofly and install ballast and track for the shoofly, and UPRR will make the final cut-ins at each end of the shoofly.

The choice of construction method and traffic handling is determined by site constraints, traffic volumes, and local agency requirements. We will work closely with cities, counties, and the Fresno Council of Governments to develop traffic analyses to confirm the appropriate traffic control measures.

Based on our review of site conditions, traffic volumes, and local requirements, Table 2-10 identifies the anticipated methods of traffic handling at each of the project grade separations during construction.

Permanent Road Closures

As part of the project, several existing streets will be permanently closed. This includes the closure of part of S. Railroad Avenue, E. Florence Avenue, S. Sarah Street, S Belgravia Avenue, S. East Avenue, and S. Orange Avenue for the Jensen Trench; the closure of W. Belmont Underpass, N. Thorn Avenue, and part of Golden State Boulevard for the Fresno Trench; and the closure of Kern and Mono streets in downtown Fresno. These closures will be addressed in the traffic management plan prepared by TPZP.

Railroad Operations

Two UPRR underpasses are planned in downtown Fresno, at Ventura and Tulare streets, and the construction of these underpasses will impact the operation of the UPRR freight railroad and local traffic operations, as well. Because of site constraints, construction of the underpasses here will require the temporary closure of these streets and the use of a shoofly to carry rail traffic through this portion of downtown Fresno.

Underpass construction will occur in two general phases. First, local traffic will be closed at Ventura, Tulare, and Fresno streets, and excavation and construction of the high-speed train structures will occur. During this time, at-grade crossings at Kern and Mono streets will remain open. When the high-speed train bridges are complete, TPZP will construct a double-track shoofly and place railroad track and ballast along the alignment of the high-speed train (UPRR forces will construct the cut-overs), relocating the crossing gates at Kern and Mono streets to the shoofly crossings. In the second phase, trains will be detoured to the new track over the new high-speed train underpasses while the remaining excavation and construction of the UPRR underpasses occurs. When this is complete, freight service will be returned to the existing UPRR track and new underpasses, and traffic will be restored to the affected cross streets. At-grade crossings at Kern and Mono streets will then be permanently closed. A layout of the staging for these downtown crossings is shown in Figure 2-8.

The high-speed rail alignment will also cross under two spur lines operated by the SJVRR near the Dry Creek Canal. As part of a wye, the underpasses will be constructed one leg at a time, allowing one spur track to remain in service at all times.

Haul Routes

During construction, it will be necessary to designate certain roadways as haul routes to allow the movement of earthwork and delivery of materials. The cleared alignment will be used as a haul road to minimize impacts on traffic and on local pavements. We have developed haul routes and haul route schedules to include portions of SR 99, G Street, and Golden State Boulevard, in the city of Fresno.

Phasing to Reduce Impacts

The TPZP traffic management plan will phase adjacent construction elements to minimize traffic congestion and out-of-direction travel. Work will generally proceed in discrete packages. The majority of roadway crossings will be overheads, and with proper traffic control, will remain open during construction. The construction of high-speed train and UPRR underpasses at Ventura and Tulare streets and the high-speed train underpass at Fresno Street will require the closure of these streets; however, track crossings will

Table 2-10: Traffic Control for Grade Separation Construction

	RFP CP-1 Baseline Roadway Grade Separations	Existing Railroad Condition		RFP Based Proposed			
		Existing	Future	New Roadway Alignment	Traffic During Roadway Construction	Existing Lanes	Lanes Open During Construction
NORTH	Ave 15 1/2	At Grade	Overhead	Shifted	Remain Open	2	2
	Ave 15	At Grade	Overhead	Shifted	Remain Open	2	2
	Ave 13	At Grade	Overhead	Shifted	Remain Open	2	2
	Ave 12	At Grade	At Grade	Shifted	Remain Open	2	2
	Ave 11	N/A	N/A	Centered	Detour	2	2
	Ave 10	N/A	N/A	Shifted	Remain Open	2	2
	Ave 9	N/A	N/A	Centered	Detour	2	2
	Ave 8	N/A	N/A	Centered	Detour	2	0
	Ave 7	N/A	N/A	Centered/Shifted	Detour	2	0
CENTRAL	Veterans Blvd*	None	Overhead	By Fresno	By Fresno	0	By Fresno
	Shaw Ave.	At Grade	Overhead	Centered	Remain Open	4	4
	Ashlan Ave.*	Overhead	Overhead	By Caltrans	By Caltrans	4	By Caltrans
	Clinton Ave.*	Overhead	Overhead	By Caltrans	By Caltrans	4	By Caltrans
	McKinley Ave.	At Grade	Overhead	Centered	Remain Open	2	2
	Olive Ave.	At Grade	Overhead	Shifted	Remain Open	4	2
	Belmont Ave.	Underpass	Overhead	Shifted	Remain Open	3	2
	Stanislaus St.	Overhead	Overhead	Centered	Detour	2	0
	Fresno St.	Underpass	Underpass	Centered	Detour	4	0
	Tulare St.	At Grade	Underpass	Centered	Detour	3	0
	Ventura St.	At Grade	Underpass	Centered	Detour	4	0
SOUTH	Church St.	At Grade	Overhead	Centered	Detour	4	0
	E. Jensen Ave.	Overhead	Overhead	Shifted	Remain Open	4	2
	E. Central	At Grade	Overhead	Centered	Detour	2	0
	E. American	At Grade	Overhead	Centered	Detour	2	0

Construction completed by Caltrans or City of Fresno

still occur at Kern and Mono streets, which will remain open until underpass construction is complete.

2.1.14. Addressing Maintenance Considerations (Design and Construction)

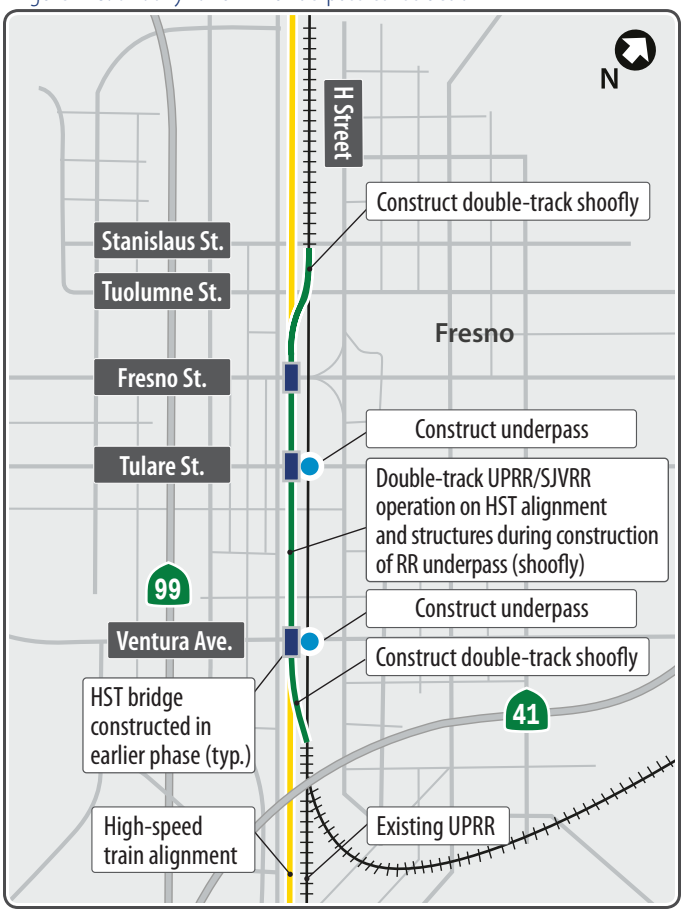
Our approach to maintenance in the design and construction of the CAHSR CP1 project will be tied to the sustainability considerations that are discussed in Section 2.2 of this proposal. The choice of sustainable and durable materials and systems in the design and the implementation of sustainable solutions in construction will reduce life-cycle maintenance costs. Examples include the use of native, noninvasive site vegetation that does not require extensive irrigation and the use of berms for noise reduction, in lieu of sound walls, where possible.

Chukwuma Umolu will be TPZP's Warranty Manager during construction and the two-year warranty period following construction. As specified in the general provisions, TPZP will, under Chukwuma's direction, prepare a warranty service plan that will describe how installed project elements will be serviced by TPZP after final acceptance. Chukwuma has been involved in transit projects in California for more than 15 years and is thoroughly familiar with the warranty requirements of this contract.

Maintenance Considerations – Design

Consideration of maintenance requirements will begin in the design phase. Adequate up-front planning for the ongoing

Figure 2-8: Shoofly for UPRR underpass construction



maintenance effort is essential to ensure an effective, cost-conscious approach to maintaining the high-speed train system. The TPZP team will utilize best practices, such as evaluating life-cycle costs, durability, and safety, to develop design elements that consider and reduce the need for ongoing, extensive maintenance. We understand the CHSRA's requirement for the design and construction of a durable system, where the need for maintenance is minimized and can be carried out without impact to train operations. Table 2-11 details maintenance considerations for the project.

The maintenance of some of these elements will become the responsibility of local agencies, and TPZP will work closely with each of them during design, coordinating through interface coordination and design integration workshops to ensure that their best maintenance practices, such as choice of materials, reduction of quantity of materials, and durability, will be incorporated in the design.

We will meet early in the design phase with representatives of the public works or maintenance departments of the City of Fresno, County of Fresno, City of Madera, and County of Madera, as well as with the Fresno and Madera flood control districts, to discuss maintenance requirements and issues and ways to incorporate best practices in the design.

Although systems are not included in this phase of the project, the design must consider access and safety in the maintenance of system elements that will be designed and installed in future contracts. The design must include the maximum amount of flexibility to accommodate future systems. For example, the overhead catenary system (OCS) has yet to be fully designed, but this construction should not restrict the choice of OCS pole spacing when the system is designed. An allowance in the design of structures and retaining walls will allow pole spacing in increments of 30 feet.

Maintenance Considerations – Construction

The installation of project elements will allow for ongoing and future maintenance operation during construction, in the warranty period, and beyond. A comprehensive stormwater pollution prevention plan (SWPPP) will be prepared that will identify specific best practices that TPZP will employ in the construction phase to minimize adverse stormwater construction impacts. To reduce embankment and channel erosion, we will carefully phase construction activities, minimize disturbed areas, promptly stabilize soils, control stormwater flow, and protect slopes. Embankments will be constructed and protected with straw erosion control blankets until applied hydroseeding is established. Pipe slope drains will be used where necessary to control overside stormwater runoff. Drainage ditches and retention basins will incorporate stormwater protection elements as they are constructed. Temporary environmental fencing will be utilized to avoid disturbing areas outside the construction zone and as required for environmental protection and monitoring. Trackway subgrade will be protected as required. Finally, maintenance practices and the SWPPP will be monitored, evaluated, and adjusted to adapt to changing site conditions that occur during construction.

Warranty Period

The contract warranty will commence upon final completion and will continue for two years after final acceptance. Because of funding availability, there may be a period of time between the final acceptance of this project and the following projects to install trackwork, stations, and systems. This will put more importance on the need for easily maintained elements in the original design and construction. It will also require the commitment of the TPZP team and Warranty Manager Chukwuma Umolu, who will remain with this assignment during the warranty period and be readily available.

2.1.15. Public Involvement and Community Relations

TPZP understands that the stakes are much higher with the initial CAHSR CP1 project than with subsequent CAHSR projects in that this project sets the tone for the entire initial construction segment in the Central Valley. Public opinion can either dramatically improve or hamper the efficiency of the project. The best course of action to improve and sustain community relations is to proactively engage and communicate with the public. To that end, TPZP has already embarked on laying that groundwork by doing extensive local outreach and retaining specialists (LA Group and Wheelhouse Strategies) to assist in this effort. TPZP has taken this additional step to be engaged in the community because we understand the need to create partnerships with the communities in which we work.

Edgar Gutierrez will serve as the TPZP Public Involvement/Stakeholder Manager, and he will have overall responsibility for coordinating our efforts with affected third parties, as well as with the public.

Our commitment is to deliver consistent, effective engagement and communication strategies that positively position the project for success in the greater Fresno/Madera area and in future alignment communities. With this in mind, TPZP will execute a proactive communications, community

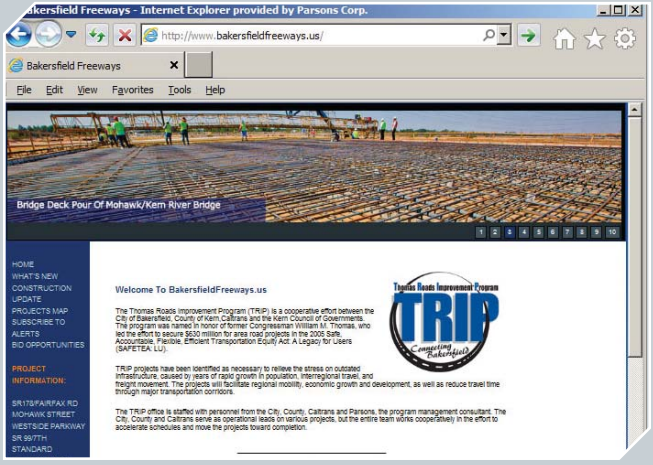
Table 2-11: Maintenance Considerations

Design/Construction Element	TPZP Actions
Future systems	Consider access and maintenance of future systems. This includes power systems, overhead catenary systems, and communication systems. Examples include maintenance turnouts and parking areas for future service.
Maintenance access roads	Maintain temporary and permanent access roads as required by local jurisdictions and emergency response authorities. Work with flood control and canal districts to provide access to their facilities.
Fences	Consider accessibility to facilitate repair or replacement.
Embankments	Design slopes to meet standards. Hydroseed with drought-tolerant mix to establish ground cover. Monitor settlement and slope stability through regular surveys and instrumentation.
Subgrade	Trackway subgrade will be protected as required.
Material selections/ sustainability	Life-cycle analysis to reduce long-term operations and maintenance costs.
Landscaping	Use drought-resistant plants. In rural areas, minimize the use of irrigation systems. Adhere to water conservation guidelines of CalGreenCode for maintenance of facilities and stormwater management.
Pumping stations	Maximize runoff retention to minimize required pumping requirements. Use efficient pumps. Standardize with City/County equipment for ease of maintenance and available parts. Provide for ease of future inspection and repair.
Street lights and traffic signals	Standardize with city/county equipment for ease of maintenance and available parts.
Culverts	Utilize 24-inch minimum for ease of cleaning. Avoid long culverts.
Drainage channels and detention basins	Consider access for ease of cleaning and grading.
Retaining walls	Use anti-graffiti protection, ribbed surfaces, front landscaping.
Bridges	Minimize steel that will require future cleaning and painting. Specify low-maintenance joints and bearing pads. Provide for ease of future inspection.
Guard rails	Consider concrete barrier where cost-effective.
Intrusion protection barriers	Provide gaps for maintenance access.
Security system	Provide fencing and monitoring to prevent vandalism and damage to the completed work.

involvement, and impact mitigation program by taking the following actions:

- Capitalizing on TPZP's history and experience in dealing with transportation construction projects and other relevant experience
- Identifying and partnering with a wide range of influential leaders, both statewide and in local communities, based on numerous existing relationships throughout the high-speed train corridor Organizing regular meetings in each major community along the project alignment to inform and respond to questions from interested parties and to gain support for the project
- Organizing regular meetings in each major community along the project alignment to inform and respond to questions from interested parties and to gain support for the project
- Effectively engaging ethnically diverse and non-English-speaking communities/groups and garnering project support from them by talking to elected officials, businesses, and community leaders; writing letters; attending workshops; and being a voice for the media
- Reflecting the geographic and ethnic diversity of project stakeholders, particularly those that will be directly affected
- Providing frequent and regular updates both in traditional media, such as newsletters, and in new media, such as email, blogs, social networking sites, and other web-based communications
- Working closely with key stakeholder groups to build an understanding of the project and its impact in the greater Fresno/Madera area, including, but not limited to the following:
  - Federal, state, county, and city elected officials
  - Business and community organizations
  - Key business and community leaders
  - Landowners along and adjacent to the alignment
  - Agricultural leaders/farmers

As a subcontractor to Parsons on the TRIP/Bakersfield Program Management project, the LA Group is assisting and collaborating with the City Public Works Department in maintaining a well-used web page. Subscribers also receive email updates regarding road closures.



- Public entities, such as school districts, community college districts, and Fresno State University
- Mainstream and niche media outlets
- Other stakeholder regions that will be impacted down the alignment (e.g., Kings County) to start building trust and strengthening relationships in the process

- Responding to legislative concerns and industries that will be affected and that will benefit as a result of the project
- Providing transparency in the project process and carrying out all public outreach activities to achieve this important goal

Capitalizing on TPZP's statewide and local issue understanding, we will prepare and deliver a community relations strategy that conveys timely, recurring, and relevant project information to provide insight to the project's progress, mitigate impacts, and help build community support. Our communications will be tailored to each community and will be focused to address specific issues that impact one alignment community, but may go unnoticed in another community. TPZP will also ensure that the alignment community is provided multiple avenues to communicate with us. Through the development and execution of a PIP with a subset business and residential impact mitigation plan, we will work diligently to implement a robust communications and community involvement program while also minimizing impacts to businesses, residents, and traffic — all critical components to the successful deployment of the CAHSR CP1 project.

2.1.16. Coordination with Major Public Relations Stakeholders

Coordination and liaison with third parties during design and construction will be a significant and full-time effort for TPZP. This is further discussed in Section 4. Edgar Gutierrez will serve as the Public Involvement/Stakeholder Manager, as discussed in Section 2.1.13. TPZP will place a high priority on being responsive to the concerns of the public, neighborhoods, and business owners throughout the life of the contract. The key is to keep stakeholders informed throughout the construction process and to continually garner public input through the execution of an open and responsibly planned PIP. It is the goal of TPZP to establish and maintain trust with our community partners. In order to best achieve this goal, TPZP will ensure that all stakeholders are equipped with up-to-date and comprehensive information. TPZP will also be responsive to the dynamics of the project as it unfolds, addressing yet unforeseen community issues in the most transparent manner possible and engaging all the affected stakeholders in a resolution process.

Major Stakeholders

These are the owners or operators of affected property and facilities other than utilities. The CHSRA has, or will have, master agreements with these parties that specify the technical and legal conditions under which the project will deal with their facilities. These stakeholders are listed in Table 2-12.

Table 2-12: Major Public Relations Stakeholders

City of Fresno	County of Madera
California Department of Transportation (Caltrans)	Madera Flood Control District
City of Madera	UPRR
Fresno Irrigation District	Fresno Flood Control District
County of Fresno	BNSF Railway
Madera Irrigation District	San Joaquin Valley Railroad

With the CHSRA, TPZP will work with these stakeholders in a collaborative, proactive, and transparent manner to deal with issues before they can delay the project, add costs, or compromise quality. TPZP will take the lead in implementing stakeholder coordination conditions identified in the master agreements. This will include the following:

- Conducting and facilitating an initial kickoff workshop
- Facilitating any partnering meetings that may be held
- Conducting, facilitating, and documenting monthly stakeholder coordination meetings
- Collaboratively developing a stakeholder charter
- Developing an issues resolution ladder

Major stakeholders will be apprised of work affecting their facilities. The review will vary by stakeholder, as may be stipulated in master agreements with the CHSRA. This may include individual reviews of plans and specifications at the 30 percent, 60 percent, and 90 percent development phases, and construction phasing. TPZP will be the clearinghouse for the distribution and tracking of major stakeholder reviews and for follow-up actions that will keep the design-build effort on schedule.

Caltrans will be a special partner in the CAHSR CP1 project, as it has facilities that will be impacted by the design-build effort, and it will be responsible for the design and construction of a 2-mile-long relocation of SR 99 between Clinton and Ashland avenues. The TPZP team is ideally suited to coordinating work with Caltrans. For the past six years, Parsons and

Caltrans District 6 have been collaborative partners in the $1.25 billion TRIP/ Bakersfield Program Management contract that includes projects on SR 99, SR 58, and SR 178.

2.1.17. Outreach Anticipated

TPZP will emphasize ongoing, extensive, timely dialogue with stakeholders. We will utilize a public forum concept (e.g., town halls and public workshops), in which all levels of individuals, organizations, communities, businesses, and interest groups will have an opportunity to establish a trusting, respected, and 365-day-per-year-accessible communication link with the CHSRA and its transportation partners. From the CAHSR CP1 project's award to its completion, we will ensure that all stakeholders are informed of the construction progress via effective communication and outreach methods. Table 2-13 is a list of the major stakeholder groups and members. Edgar Gutierrez will serve as the Public Involvement/Stakeholder Manager, as discussed in Section 2.1.13.

There will also continue to be outreach to attract SB and local firms to participate in the jobs being created by the CP1 project. This will be an ongoing effort that will maximize job creation benefits throughout CP1-5.

2.1.18. Methods of Mitigating Negative Project Impacts

TPZP understands that this project has had a long environmental process. We have addressed in Section 2.1.6. that there are issues that will likely arise, and it will be paramount to maintain the credibility and confidence of the stakeholders. Integral to this goal is the ability to quickly and effectively respond to issues as they arise. However, the most effective method for mitigating stakeholder concerns is to prevent them from occurring at the onset of a project. TPZP's approach will rely on proactive, not reactive, outreach methods. We will operate in a mode of anticipation by evaluating and anticipating what could, would, or should happen to minimize risk and to reduce the opportunity for surprises. We firmly believe

Table 2-13: Outreach Anticipated

Stakeholder Groups	Subcategories/Sample Stakeholders
Elected Officials	***Congress Members:*** Jim Costa, Kevin McCarthy, Jeff Denham, Devin Nunes. ***CA Senators:*** Michael Rubio, Tom Berryhill. ***Assembly Members:*** Kristin Olsen, Connie Conway, Henry T. Perea, David Valadao. ***Mayors:*** Ashley Swearengin, City of Fresno; Rob Poythress, City of Madera; Lynne Ashbeck, City of Clovis; Lou Martinez, City of Hanford; Ray Lerma, City of Corcoran; Jsaac Jackson, City of Chowchilla; Stan Thurston, City of Merced. ***Board of Supervisors:*** Madera, Fresno, Kings. ***City Councils:*** Fresno, Clovis, Madera, and a few select individuals on the Hanford and Corcoran city councils.
Local/State/National Agencies	Caltrans, United States Army Corps of Engineers (USACE) Fresno Cultural Arts District.
Utility Owners	PGE Gas, PGE Electric, ATT, City Water, City Sewer, Canals, Level 3, Time Warner, Comcast, Kinder Morgan
Airports	Madera Municipal Airport, Fresno Chandler Airport, Fresno Air Terminal.
Businesses and Business Organizations	Shopping centers, business parks, agricultural, industrial, stand-alone businesses (mom-and-pop locations). Business organizations/chambers, including Central California Hispanic Chamber, Fresno Area Hispanic Chamber, Madera Chamber, San Joaquin Valley Black Chamber of Commerce, Fresno County Women's Chamber, Fresno West Coalition, Fresno Center for New Americans, SBA Fresno, EDC Fresno and Madera, Central Labor Council of Fresno, Greater Madera Industrial Association, Association of General Contractors, Association of Builders and Contractors.
Residents/Other Constituents and Interested Parties	Single-family and multifamily homes, homeowner associations, nursing homes, senior housing, veterans groups, commuter communities, community based organizations, etc.
Emergency Service Providers	Fire department, police department, California Highway Patrol, hospitals/medical centers, clinics, ambulance services.
Schools/ Unified School Districts	Fresno Unified, Madera Unified School District, Madera High School, Madera Ranchos, Madera County Office of Education, Fresno County Office of Education, Tulare County Office of Education.
Educational Institutions	Community colleges, universities, and adult schools, including State Center Community College District, Madera campus; Fresno State University; West Hills Community College, Lemoore Campus; etc.
Public Attractions	Madera Fairgrounds, Forestiere Gardens, Fresno Chaffee Zoo/Roeding Park, tribal casinos, etc.
Media	Print, radio, TV/cable outlets, trade journals, wire services, ethnic/foreign-language media, government and legal publications, special interest press (e.g., senior citizens, students, etc.). Includes, at a minimum, ***Business Street Online, Central Valley Business Times, Fresno Bee, Associated Press Fresno Bureau, Madera Tribune, The Business Journal.***

that project understanding is inherent to project success and acceptance. As such, effective outreach is the cornerstone of a strong and responsive relationship with stakeholders. When stakeholders understand a project and are well informed, misconceptions and myths are diminished. Collective decision making and practical solutions are important elements for fostering consensus and diminishing opposition.

Even so, TPZP will be prepared to handle unanticipated incidents and understands the level of sensitivity such an event would demand, as it may generate community or media interest. If such a situation were to occur, TPZP will inform the CHSRA immediately and will cooperate with the CHSRA's direction regarding the distribution of information. By working very closely with the CHSRA, we will ensure that a CHSRA spokesperson is always available to speak with the media. TPZP will also ensure that all field supervisors and other management personnel are aware of and follow the CHSRA's emergency notification procedures in the event of an emergency.

TPZP will initiate immediate responses to emergencies by trained personnel from an incident response team within 30 minutes of receiving notification from either the CHSRA, a utility owner, a CHSRA official, affected business(es), resident(s), or any combination thereof. All emergencies and unforeseen disruptions will be explained to the public immediately by Edgar Gutierrez, TPZP's Public Involvement/Stakeholder Manager, who will maintain open and continuous communications. TPZP understands that the CHSRA must be made aware of the issue and explanation immediately. The individual making the contact shall provide to the affected party(ies) information such as the following: (a) cause of disruption (i.e., whether it is construction-related or not), (b) actions being taken to alleviate the problem, and (c) anticipated duration of the disruption.

2.1.19. Communication Tools

To build credibility and trusting relationships with stakeholders, the team will utilize the same effective tools that have been proven on similar urban projects to share updates on the project and to provide opportunities for the stakeholders to engage. The purpose is to build in a feedback loop that informs the team of the stakeholders' sentiments (i.e., the pulse of the community), while building a system to manage expectations throughout the life of the project.

It is essential that open, communicative, and trusting relationships are maintained with stakeholders so that their interests are met while the project objectives are attained. As such, materials must be developed as often as necessary, including collateral to highlight positive news, mark key project milestones, and provide project updates to maintain stakeholder interest throughout the process.

Communication tactics and materials are most effective when they are tailored to the level of interests and concerns of project stakeholders. As such, various methods of communication will be utilized to inform and notify stakeholders of meetings, construction, and/or detours, including the following:

- Traditional and new media
- Public-accessible outreach offices
- Coordination of meetings, briefings, and ribbon-cutting events
- Project website
- Email notifications
- Development of public Information materials
- Creation of construction-related signage and distribution of public notices
- Informational billboards at strategic locations
- Staff support to the CHSRA's community relations program
- A branded communication tool that establishes a feedback loop system in which information is shared and input/information is received from stakeholders
- Development of media partners to create opportunities for regular communication through print and electronic media (specifically, ***The Fresno Bee, The Madera Tribune, The Business Journal***, KMJ radio, Comcast Newsmakers, Hmong radio, Univision [Spanish TV], etc.)
- Potential development of a hotline that community members can call with questions and concerns with the purpose of quick mitigation and communication feedback system to ensure that the issue/concern is resolved
- "Ask a question" online forum to which citizens can submit questions and answers will be posted
- Community meetings with a smaller neighborhood feel — since the team will be considered a neighbor — with particular attention given to the location and size, as well as the communication used to inform community members
- Work with Fresno State University, West Hills Community College, etc., to develop ongoing opportunities for dialogue between TPZP's professionals and the students — the future workforce and riders of the high-speed train system

To ensure that the community outreach program's fundamental elements are achieved with fluidity and maximum effectiveness, we will work with the CHSRA and community representatives to effectively communicate information and to educate stakeholders about the project through an array of communication and public involvement techniques. TPZP is committed to ensuring that all stakeholders feel informed and involved as part of the project. We feel vested in the success of this project, as it has the potential to be a major source of community pride.

TPZP's approach to communication is to keep the public engaged in the project, thus building support, through informative methods such as quarterly newsletters, monthly updates on construction progress, as-needed and localized advisories based on week-to-week project impacts, etc. This and other details are further specified in the draft PIP.

2.1.20. Public Involvement and Community Relations Plan

TPZP will develop and implement an effective PIP that relies on a full team effort, comprising TPZP, the CHSRA, and stakeholders' representatives from each construction segment. As a communications team, we all must be prepared to work together to accomplish the following:

A project team member conducts an outreach event focused on school aged children.

- Maintain, improve, and build positive public involvement for the initial construction segment of the CAHSR CP1 project; a significant part of the project will be job creation from the local union halls and local professional services required to build high-speed train, which will need to be monitored and highlighted.
- Provide meaningful mechanisms for community outreach and responding to project-area concerns.
- Mitigate construction impacts for project-area residents, business owners, and commuters.
- Provide regular reports on project progress.

TPZP will provide customized outreach initiatives to address issue-specific and stakeholder-specific matters through the development of the PIP, which will include a business and residential impact mitigation plan. As specified by the RFP, TPZP will perform the following tasks for the development and implementation of the PIP:

- Submit a draft PIP to the CHSRA for review and comment within 45 days of NTP (15 days sooner than required).
- Update the PIP at least semi-annually, soliciting input from the businesses and residents along the corridor and the stakeholders' representatives. A copy of each update will be submitted to the CHSRA for review and comment.
- Provide monthly reports of activities undertaken to implement the PIP. The monthly report must be submitted in a format agreed to by the CHSRA, via the CHSRA web portal, on or before the 10th day of the month for activities undertaken during the previous month. The report will also forecast known activities for the month ahead.
- Assess the effectiveness of the PIP. Working in conjunction with the CHSRA's communications team, we will provide information to the CHSRA that will be used to determine if any course corrections are needed in the delivery of information and interaction activities with project-area residents, businesses, and commuters.

During the time this contract is in force, TPZP will also be responsible for coordinating all public involvement issues that arise within and adjacent to the geographical limits of this contract directly with the CHSRA.

Public Involvement Plan

Based on the CHSRA's statewide goals and objectives, TPZP will develop a project-specific PIP for all construction-related activities to facilitate the management of community issues and the mitigation of construction impacts on the communities and neighborhoods adjacent to the construction work sites. At a minimum, an ongoing public information program will be developed to identify public meetings, construction advisories, newsletters, and other community outreach plans to effectively communicate the activities of construction. The PIP will also include a business and residential impact mitigation plan (see RFP Book 2, Part B, Section 53.3). TPZP will manage the community advisory plan for construction-related activities and will work closely with the CHSRA regarding community issues. TPZP will work with local jurisdictions and Caltrans to provide construction advisories and current construction-related traffic information to the public.

The PIP is integral to the success of the project, as it provides a blueprint for stakeholders to voice their issues and concerns throughout the life of the project, free from bias. TPZP's outreach efforts will be based on

Table 2-14: Public Involvement Program Services

Construction advisories	Presentation to business organizations	Stickers on newspapers
Business walks/construction tours	Project website	Text alerts to cell phones
Community updates/neighborhood boards	Articles in local print (e.g., newspapers)	Presentations to organizations
Complaint/comment forms	Direct mail	Articles in school media print
E-mail notifications	Public notices (radio, broadcast/cable TV, social media, etc.)	Campus posters
Construction signage/project identification boards	Incident notification	Booths at major events
Detour/access maps	Neighborhood walks/doorhangers	Safety kits to k-12 schools
Information hotline	Newsletters	Construction kiosks
Media – electronic and print	Presentations to homeowners	

going to the community, as opposed to asking the public to come to us. TPZP is committed to ensuring that all stakeholders feel informed and involved as part of the project. As such, our outreach efforts will include regular communication with all stakeholders, including, but not limited to, residents, commuters, elected officials, businesses, faith-based groups, community-based organizations, educational institutions, and chambers of commerce. We feel vested in the success of this project, as it could be a major source of community pride.

As part of our commitment, TPZP will implement a variety of communications strategies and tactics, including those outlined in RFP Section 53. TPZP is confident that we will successfully implement the outreach tasks below to meet the CHSRA's goals and objectives. Table 2-14 encompasses a compact list of services that will be further elaborated as part of the PIP.

Additional Tasks

Multilingual Informational and Collateral Outreach Material – TPZP will produce multilingual and culturally sensitive informational and collateral outreach materials that will be of interest and value to the Central Valley's hugely diverse community. Translation for all project-related collateral materials will be performed by TPZP.

Media Coverage – TPZP will assist with the development of public notices for TV, radio, print, and online media reports; editors; news segment producers; assignment desk editors; other reporters with interest in the project; and bloggers.

Special Events Coordination – To foster a sense of pride in the project, TPZP will coordinate special events as the project reaches major milestones. Such events could include ground-breaking ceremonies, ribbon-cutting ceremonies, site tours for students, and other community events that will promote the benefits of the project.

Database – TPZP will develop, update and maintain a stakeholder database that is capable of tracking all contacts made with the public. TPZP will also integrate any existing databases that have been developed in prior efforts conducted for and/or by the CHSRA. We will ensure that the information is imported into the CHSRA's database on a monthly basis via the CHSRA's web portal. TPZP will make sure that the database documents all contact with the public and will specifically include at least the following information:

- Contact name, business name, address, phone number, and home phone for business owners
- When the contact was made
- Who accepted/responded to the contact
- How the contact was made (in person, phone, e-mail)
- A brief description of the nature of the contact
- A brief description of handouts

The database will serve as a tool for future communication with stakeholders (e.g., notification distribution, invitations to meetings and special events, etc.) and will be a living document throughout the life of the project. A referencing system will be developed to track the distribution of handouts and mass mailings in order to minimize the amount of hard copy information filed. Additionally, a standardized form will be developed to log contact information and will become the hard copy of all contacts (handouts will be attached to this form). All contact information will be entered into the database by the recipient of the contact within three days of contact.

Fairfax Road/SR 178 Interchange

Since 2006, the LA Group has been responsible for coordinating special events and ground-breaking ceremonies for the $1.25 billion TRIP/Bakersfield Program Management project, in conjunction with Caltrans.

Community Construction Safety Program – A public safety outreach program will also be integrated into the PIP, and it will interact with the site-specific safety plan discussed in Section 6 of this proposal. This proactive approach will reduce risk and respond directly to the concerns of impacted neighborhoods. The following activities are proposed:

- Open public-accessible outreach offices at key locations to respond to walk-ins
- Coordinate with city enforcement during and after construction to ensure compliance with traffic regulations and restrictions
- Develop community activities and/or events to promote participation in safety awareness
- Develop and distribute public safety materials (fact sheets, newsletters, web content)
- Create a kid-friendly safety kit that can be distributed to elementary schools, community centers, and child-care centers
- Coordinate and facilitate public meetings to discuss safety measures

Notice Requirements – As stipulated by Section 53.2.1 of the RFP, TPZP will ensure that the following noticing requirements are performed for each of the construction activities in Table 2-15. As part of the construction schedule subtask, TPZP will notify businesses and residents along the project and will publicize the commencement of construction in accordance with the "Table of Notifications" clause. The notices will provide, at a minimum, information addressing public safety, business impact mitigation, and proposed alternative routes and detours. This notification will indicate the projected dates for the construction by individual notices to stakeholders, community groups, businesses, and residents along the corridor, as well as along alternative routes. TPZP will also provide all relevant information concerning the construction schedule to the CHSRA, which will then publicize such information to appropriate media outlets and state or local officials.

Table 2-15: Notice Requirements

Construction Activity	Notification Period	Types of Notifications to be Issued
Heavy Construction Notification	30 days before construction	Written notification and access maps will be provided per the maintenance-of-traffic plan.
Light Construction Notification	Three days before construction	Written notification and access maps will be provided per the maintenance-of-traffic plan.
Critical Utility Shut-off/Diversion	At least 72 hours in advance but not more than 96 hours before	Written notice of shut-off, diversions, or both.
Business/Commercial Utility Shutdown	72 hours before	Written notification.
Residential Utility Shutdown	48 hours before	Written notification.
Heavy Construction Updates	Weekly	Construction updates will be provided to each business or resident fronting a heavy construction zone.
Road and Driveway Closures	At least 72 hours in advance, but no sooner than seven days before closure	Written notice and personal contact.
Construction Schedule	One month before start of construction	Provide monthly construction schedule.

All utility shut-off/diversion arrangements and notification requirements will be confirmed by the master agreements, which the CHSRA is currently negotiating with affected utilities.

TPZP will also utilize the noticing process as a vehicle to keep the local stakeholders apprised of the transportation benefits, as well as other regional and statewide benefits, expected to result from the statewide high-speed train system. Project benefits could include, for example, decreased travel times, increased accessibility to employment, and other transportation accessibility advantages.

Weekly Written Reports – TPZP will provide weekly written reports to the CHSRA in a format agreed upon by the CHSRA that identify the nature of public contacts, as well as responses by TPZP for the preceding week. TPZP will also be available at the request of the CHSRA to discuss the reports.

Targeted Outreach to Minorities and Lower-Income Groups:

- Provide meeting notices to low-income and minority interest groups, advertisements in Spanish-language newspapers, meeting notices in low-income and minority-service community facilities, additional information in Spanish, and Spanish-language (and Lao and/or Hmong, if required) interpreters at the meetings.
- Establish a telephone hotline that uses interpreter services to receive comments, and provide information on the hotline regarding all Spanish-language materials.
- List advertisements in Spanish-language newspapers, post meeting notices (in English and Spanish) at community facilities that serve low-income and minority populations, provide a telephone number to call for information in Spanish, and provide Spanish interpreters at public hearings.
- Work with Fresno and Madera housing authorities to target public housing residents to ensure awareness and engagement.
- Contact environmental justice interest groups to offer project updates, ask about how to reach populations, and gather suggestions for other groups to contact.
- Utilize key connectors to minority communities, including, but not limited to, Hmong, Hispanic, and African American communities, through the following entities and organizations:
  - San Joaquin Valley Black Chamber of Commerce
  - Central California Hispanic Chamber of Commerce
  - Fresno Area Hispanic Chamber of Commerce
  - Key Southeast Asian community and business leaders

Business and Residential Impact Mitigation Plan

TPZP is familiar with the major business, industrial, and agricultural centers, as well as the residential neighborhoods that are located on or near major streets that transect the project corridor, that could be affected by construction impacts (e.g., noise, dust, potential loss of street parking, traffic disruptions, etc.). Under any impact scenario, members in the business and residential communities will likely raise concerns on the impacts that the project will have on their revenue and/or quality of life. Thus, it is imperative to establish a business and residential impact mitigation plan that will quickly and efficiently mitigate any anticipated concerns. The goal of the business and residential impact mitigation plan is to mitigate the concerns of local businesses and residents that will be directly affected by the CAHSR CP1 project alignment.

As stipulated by the RFP, TPZP will complete, update, and submit a business and residential impact mitigation plan based on the summary included in this proposal. This plan will include, but is not limited to, the public information activities described in the Outreach Anticipated section of this proposal, as well as sections 53.3 – 53.11 of the RFP. In addition, TPZP proposes the development of a business profile for all of the businesses located throughout the corridor. These profiles could be incorporated or

Capitalizing on TPZP's statewide and local issue understanding, we will prepare and deliver a community relations strategy that provides timely, recurring, and relevant project information and that offers insight to the project's progress, mitigates impacts, and helps build community support.

linked to the stakeholder database information within the list of proposed tasks for the PIP.

2.1.21. Organizational Chart for Community Relations

TPZP is made up of highly qualified personnel who are very experienced in their assigned positions and who are able to facilitate the seamless integration of community relations into the design and construction phases. The team will implement its proven culture early on in the project and will ensure that critical aspects of community relations are being managed appropriately and with the CHSRA's best interest in mind. We are dedicated and committed to helping the CHSRA achieve its goals and to delivering this project successfully.

Our community relations process is designed to ensure accountability; QA; and clear, measurable results. The management structure, as shown in Figure 2-9, ensures a seamless operation with key point people in their respective areas.

TPZP has engaged Lee Andrews Group, Inc. (LA Group), to manage community relations for the project. LA Group is a SB with nearly 20 years of experience developing and managing relevant public participation programs for large-scale public projects in transit, aviation, environmental compliance, and land-use development. Many of these projects were operated under complex circumstances and required multi-agency interaction at the local, state, and federal levels. Donna Andrews, president of the LA Group, will be a Strategic Advisor. A community relations project manager on several significant rail-related projects and a former California high-speed rail commissioner, Donna brings an unequaled understanding of the challenges facing the project. Edgar Gutierrez will serve as the full-time Public Involvement/Stakeholder Manager, responsible for managing the PIP. Edgar has more than five years of experience managing community outreach programs and leading successful coalition-building efforts among diverse groups, including elected officials, multicultural audiences, faith based communities, local businesses and a variety of other integral stakeholders (e.g. first responders, schools, utilities, etc.) He will have real-time access to all project details that may be relevant to the public,

PUBLIC INVOLVEMENT PLAN

The development of the PIP will be consistent with CHSRA goals and will include the following elements:

- Provide meaningful mechanisms for community outreach and responding to project-area concerns
- Mitigate construction impacts for project-area residents, business owners, and commuters
- Promote community confidence in the project and the level of sensitivity being conducted to address any possible construction issues
- Personally and respectfully work with residents and businesses adjacent to the project alignment while providing information on how the character, ambience, and cohesion of their neighborhoods is being maintained
- Provide information on the regional and statewide significance of this project
- Provide for multicultural and language diversity within each community through trusted communication sources, such as faith-based organizations, local news outlets, and urban forums
- Ensure clear and convenient methods of communication and opportunities to provide input in ways that actually reach people, such as Facebook, YouTube, and Twitter
- Ensure that the community is informed of construction activities in a timely manner
- Disseminate accurate and dependable information, in multiple languages where applicable
- Provide access to real-time project information, as well as easily accessible means for the community to communicate complaints and concerns
- Provide advance notice of open houses, as well as other communication and participation opportunities, through social networking and traditional media modes
- Tailor an appropriate message and identify the natural message carrier using the coalition of partners built through outreach efforts

public agencies, emergency service providers, businesses, etc. As the public involvement manager, he will serve as the day-to-day contact and will ensure that all information, as requested by the CHSRA, is provided in a timely manner.

Supplementing LA Group, as its subconsultant, will be Wheelhouse Strategies, Inc — a Fresno-based SB public affairs firm — which will deliver the on-the-ground public outreach and community engagement effort, using its understanding of the local political, social, and economic impact of the alignment. Kristine Walter, the Local Outreach Lead, as well as Samantha Bauer, the Local Outreach Specialist, will facilitate communication among all stakeholders and will represent the project at public meetings and other occasions. They will also lead the production, implementation, audit, QA/QC, and updates for the project information website. This combination incorporates into the TPZP team a full-service outreach and government relations expertise with demonstrated experience in strategic advice, issues management, crisis communications, and direct communications. Thus, the TPZP team has an astute understanding of the full range of impacts that transportation projects may have on surrounding communities, as well as the corresponding outreach services needed to address the vast range of impacts. We also have a unique local perspective and strong understanding of local community concerns that have been voiced during the environmental review process, including, but not limited to, the location of high-speed train stations and alignment; the potential devaluation of property; the location of the heavy maintenance facility; property acquisition and displacement of people and businesses; employment opportunities; air quality, congestion, noise, and other project impacts; agricultural impacts; connections to local transit; economic benefits and impacts on local businesses; and the use of domestic labor and products for construction.

Depth of Skilled Personnel and Quality Technical Resources – TPZP has the experience, resources, and people necessary to complete all the requirements, deadlines, and expectations required for this effort. Our staff will remain flexible in order to facilitate staffing changes and will be mobilized on the project, as necessary. The accompanying staff will be equipped with all the necessary tools and items needed to complete their tasks efficiently and effectively. Our past experience on the Alameda Corridor Mid-Corridor Trench, Houston Metro Solutions, and I-25 T-REX design-build projects provides us a history on which to base our staffing decisions. TPZP will take into consideration the specific needs that each task requires and will make necessary adjustments to meet the needs of the scope of work. By committing to achieving specific objectives and maximizing the effectiveness of each participant's resources, we will leverage the strengths of the TPZP team, the CHSRA, the community, and other stakeholders, as a whole, to the benefit of the CAHSR CP1 project.

Figure 2-9: Community Relations Organizational Chart

2.2.DRAFT SUSTAINABILITY APPROACH

The TPZP team has reviewed and understands the multi-agency memorandum of understanding for achieving an environmentally sustainable high-speed train system in California, signed by the CHSRA, and we are committed to supporting the MOU goals and objectives through the successful accomplishment of sustainable solutions on the project. These goals and objectives were carried forward into the RFP with a specific set of expectations and requirements for the delivery of a sustainable high-speed train system in California. We have a very clear and detailed process for delivering sustainable solutions that will reflect the RFP requirements and allow the TPZP team to report back on the achievement of the MOU's sustainability objectives. The TPZP team sets a standard for being good

David Carlson, CSR-P

Underscoring sustainability as one of Parsons core values, David Carlson serves as Parsons' director of sustainable development for transportation. His depth of experience and understanding of sustainable best practices will enable him to make substantial contributions to TPZP's status as a responsible steward of the environment and will ensure that sustainability is at the heart of all of our projects.

environmental stewards, and we are committed to conducting our enterprise in concert with environmental/energy, sociocultural, and economic goals that benefit future generations. Our vision is to apply sustainability concepts to everything we do, and we have internal systems in place to foster the implementation of sustainable solutions.

Leading our commitment to sustainability is David Carlson, who is Parsons' director of sustainable development for transportation. He focuses on the oversight, tracking, and growth of sustainability service offerings to government transportation agencies and private transportation providers and the enhancement of Parsons' internal sustainability program. David is a nationally recognized leader who offers a perspective based on direct experience and a deep understanding of the best sustainability practices, and he provides vision and creativity to keep Parsons' sustainability services on the leading edge. Before joining Parsons, David served as a senior environmental protection specialist for the FHWA, where he was the program manager for the sustainable highways self evaluation system. Before working for the FHWA, he was the transportation National Environmental Policy Act reviewer for the EPA's regional offices in San Francisco and New York. His depth of experience and understanding of sustainable best practices make him a valuable part of the TPZP team.

In order to reinforce our commitment to the project sustainability goals and objectives, the TPZP team will utilize the Parsons Sustainability Handbook. The Parsons Sustainability Handbook institutionalizes a corporate culture of sustainability, identifies sustainable best practices, and provides guidance for implementing sustainable solutions that can be consistent with client needs and objectives. Building upon the Parsons Sustainability Handbook, the Parsons Dynamically Green Transportation program was developed, which is used to highlight the connections between mobility, ecology, and community goals and refers to an umbrella of techniques and practices that will deliver sustainable transportation solutions to our projects. It is based in part on the techniques outlined in the Parsons Sustainability Handbook, the American Public Transportation Association (APTA) sustainability guidelines, and best practices and techniques in the larger transportation industry, such as context-sensitive solutions, low-impact development, greenhouse gas reduction, design for energy efficiency, full-service processes, and sustainable return on investment.

The cornerstone of effectively creating and delivering a sustainability plan and achieving the project goals laid out in the RFP is using an integrated design process (IDP). An IDP is essential to the delivery of the sustainable solutions in that it lays out the roles and responsibilities of the interdisciplinary team members for achievement of sustainability goals and performance measures. The TPZP team will work with the CHSRA and the stakeholders to determine the correct performance criteria and values for the project based on the RFP goals, objectives, and requirements, along with others that could emerge. The Dynamically Green Sustainability Roadmap (Figure 2-10) summarizes the approach and process for the development of our sustainability plan and practices. Each step is explained in more detail in below.

1. Establish Sustainability Focus Group

The TPZP team will establish a multidisciplinary focus group to guide our overall sustainability approach to the project. The focus group includes experts in planning, design, construction, and maintenance. As the project moves through the design and construction stages, the sustainability focus group will be responsible for monitoring and advising the TPZP team, while identifying and recommending new sustainable design concepts.

2. Stakeholder Coordination

The team will identify key internal and external sustainability stakeholders to participate in the development of the sustainability plan. External stakeholders will include representatives from other public agencies.

3. Establish Goals, Objectives, and Metrics

Starting with the MOU and RFP goals and objectives, the TPZP team will work with the CHSRA to define other triple-bottom-line sustainability goals and objectives for the project and to identify metrics to measure progress. TPZP will add other sustainable and stewardship criteria as we develop our design approach.

4. Identify and Define Sustainability Practices and Approaches

The TPZP team has and will continue to research, evaluate, and compare similar large-scale sustainable practices and approaches to identify all solutions applicable to the project. We will review promising technologies and practices that we can use to build on our industry-leading practices and research efforts in areas such as waste management, recycling, and green building.

5. Establish Baseline and Select Preferred Practices and Approaches

As identified in the RFP requirements, an important element for the IDP is to establish a baseline design and construction approach to benchmark our sustainability efforts. Once we establish our baseline actions, we will then select the preferred practices and approaches based on 4, above, to improve the sustainability of the project and to start to define our metrics.

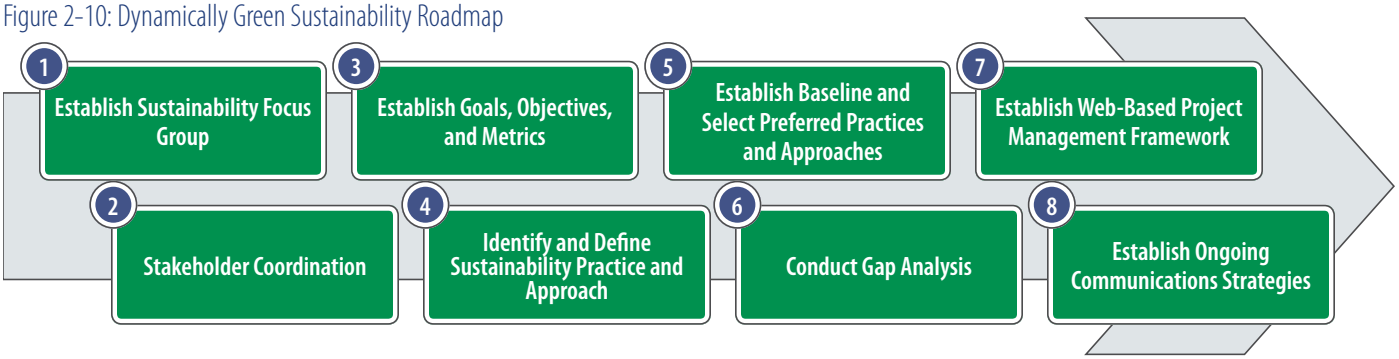
6. Conduct Sustainable Solutions Analysis

We will compare our selected preferred practices and approaches to the baseline using a decision and risk analysis matrix. The matrix will utilize life-cycle analysis to analyze up-front costs, labor costs, maintenance costs, replacement costs, and residual value to sustainable design solutions. In addition, the matrix will evaluate qualitative benefits, such as ecosystem services, public relations, and cultural heritage. Results of the analysis will determine which of the selected preferred practices the team will implement.

7. Establish a Web-Based Project Management Framework

We will track the implementation of sustainability practices and approaches using a web-based project management system. This system will incorporate goals, objectives, and metrics for the overall project to foster cross-function team integration and collaboration. It is in this portal that we will track and report fuel use, water and waste use and reuse, and emissions and energy reductions.

Figure 2-10: Dynamically Green Sustainability Roadmap



8. Establish Ongoing Communications Strategy

We will create a culture of sustainability among the team, stakeholders, and the public through ongoing education programs, public outreach, partnering sessions and workshops, and the project website. The communications strategy for the sustainability plan will be integrated into the overall project communications plan.

Using the IDP to incorporate the RFP sustainability requirements and expanding on those with the various Dynamically Green Transportation practices, we strongly believe that we will enhance and improve the environment. We believe that by having proactive discussions with stakeholders and team members regarding design techniques that have proven capabilities to achieve multiple goals, providing community and environmental benefits, we can find that important balance between community values and project budgetary constraints.

For example, Parsons deployed this approach to develop a detailed and robust program to meet the sustainability goals and objectives of the MIA Mover Automated People Mover System project. The team engaged project stakeholders and the community and worked collaboratively to develop design and construction practices to ensure that the project served as a local benchmark for sustainability. Several sustainable solutions were employed to reduce the project's carbon footprint, such as the use of glazed windows to reduce the amount of thermal energy passing through the building. In addition, the team's innovative design offset 70 percent of the station's energy consumption by two years with the purchase of renewable energy credits, included parking spaces for low-emitting vehicles and bike racks and changing rooms for full-time occupants, significantly reduced water consumption (an expected 30 percent reduction in water), generated a minimum energy cost savings of 14 percent by increasing energy efficiency and decreasing the amount of electricity used, and provided for the recycling of 75 percent of the construction debris.

The sustainability plan that the TPZP team will develop will contain the results of this Parsons Dynamically Green Transportation effort and will include all of the requirements found in the RFP, such as establishing the baseline, engaging the public, identifying renewable energy opportunities, and incorporating water conservation and beneficial reuse strategies.

2.3.DRAFT SUSTAINABILITY PLAN

The TPZP team will take the requirements outlined in RFP Book 2, Part B, Section 44, and add those to other sustainable solution practices that will be identified using the Dynamically Green IDP. Based on the results of that effort, the sustainability plan will contain actions and measures that will demonstrate achievement of the project sustainability goals:

- Exemplary energy-use minimization and energy efficiency
- Minimize water use
- Reduce greenhouse gas (GHG) emissions and dependency on fossil fuels
- Employ sustainable, healthy materials and reduce the extraction of scarce resources

The selection and management of materials that we use in our designs is a key component of the Dynamically Green approach. Parsons' engineers and project managers collaborate with Parsons' sustainability staff to examine opportunities to use new and highly sustainable materials in projects.

We understand the RFP and the importance of the requirements of reducing emissions and energy use beyond regulatory requirements and of looking for renewable energy opportunities, engaging in water conservation and efficiency practices, minimizing waste, and using environmentally preferred products and practicing pollution prevention.

Regarding the waste materials that we generate, we will prioritize the materials for reuse and repurposing on the project in the construction waste management plan. The TPZP team will actively seek recycling vendors for materials to be recycled and also will look for vendors that provide high-recycled-content materials and materials that can be recycled again at the end of their life. In addition, the TPZP team will look for opportunities to identify post-industrial waste streams for diversion into project materials. With these objectives in mind and the solutions we will identify in the IDP, we believe that we will achieve the goals for waste diversion for the project.

We will continue to look for construction materials that have high value and that meet multiple co-benefit objectives as part of the sustainability plan development process. For example, in the past, we have proposed using different alternative energy sources for power generation on our projects, as well as pavement and structural materials that have a high recycled content and high recyclability value and that can perform multiple functions. On the $967 million DFW Connector delivered by Zachry, the project successfully eliminated the consumption of 200,000 cubic yards of new material used to construct portions of the new highway. Zachry also eliminated approximately 17,500 large truck loads — the equivalent of 24 tons per load — being hauled a long distance from off-site. This significantly

Dynamically Green Transportation Program

In 2012, the $259 million MIA Mover Automated People Mover System project achieved LEED Gold certification from the U.S. Green Building Council (USGBC). The team also had an outstanding outreach program, Green Kids, which reached nearly 1,000 students in the Miami-Dade public school system, teaching them about green building features and sustainable practices.

reduced heavy equipment hours and relevant CO2 emissions, and lowered the final carbon footprint of this major project. It is a standard operating policy to recycle materials within Zachry's projects whenever possible in order to reduce new material consumption.

The TPZP team will seek design decisions that serve to minimize maintenance requirements, both in terms of frequency and effort. This consideration is important in order to reduce impacts to users of the system, to reduce costs to the owner, and to provide overall environmental and community benefits.

The TPZP team will include best practices in the sustainability plan that have clear measures of performance, including water and natural resources, energy efficiency, GHG emission and dust reduction, and the use of sustainable materials.

In addition to some of the specific solutions we have identified and the requirements set forth in the RFP, the TPZP team will include best practices in the sustainability plan that have clear measures of performance, such as the following:

Water/natural resources

- ***Runoff Flow Control:*** Mimic predevelopment hydrology for stormwater flows.
- ***Runoff Quality:*** Improve water quality of stormwater leaving the ROW using green infrastructure, and reuse water for on-site irrigation.
- ***Site Vegetation:*** Promote site vegetation that is native, noninvasive, and does not require irrigation.
- ***Habitat Restoration:*** Restore or improve biological integrity through wetland restoration, brownfield remediation, or comprehensive vegetation.
- ***Ecological Connectivity:*** Restore or improve wildlife mobility across the ROW, and protect or improve human safety.

Energy efficiency and GHG emission reduction

- ***Light Pollution:*** Use lighting technologies that reduce light trespass and glare into the surrounding environment.
- ***Energy Efficiency:*** Use energy-efficient lighting and mechanical systems.
- ***Thermal Pavement:*** Reduce contribution to localized increased air temperatures due to pavement reflectance, and minimize stormwater runoff temperatures.
- ***Intelligent Transportation Systems (ITS):*** Use installations of ITS to manage congestion and safety and to provide information to users.
- ***Fossil Fuel Reduction:*** Reduce the consumption of fossil fuels by non-road construction equipment.
- ***Regional Materials:*** Use locally sourced materials to stimulate local economies and to reduce transport fuel energy/emissions.
- ***Connectivity:*** Provide connectivity and opportunities to non-motorized transport and other forms of public transportation.

Sustainable materials/reduce project waste

- ***Long-Life Pavement/Structures:*** Minimize life-cycle costs by promoting the design of long-lasting pavement and structures.
- ***Pavement Reuse:*** Use pre-existing pavement structures to minimize the need for extraction/production of raw materials and to reduce materials transport need.
- ***Earthwork Balance:*** Reduce the need for transport of earthen materials.
- ***Recycled Materials:*** Reduce the extraction and production of virgin materials.

In order to establish appropriate sustainability plan performance measures, the TPZP team will refer to the National Cooperative Highway Research Program Report 708 sustainable performance measures for transportation agencies and the APTA sustainability guidelines. As we stated in Section 2.2, we will establish a baseline for assessment in step five of the IDP and will use that baseline to establish appropriate performance measures.

The TPZP team will link the performance measures back to the objectives and goals to ensure that we will have feasible, measurable, and reportable metrics. We view the sustainability plan as a living document and will

The Dynamically Green Transportation program provides for the opportunity to view design and materials with a different set of values, not limited to just budget and time, but also including long-term benefit, reduction of resources and costs, environmental and community benefits, and intangible values.

consistently and cooperatively work with the CHSRA to re-evaluate the degree of accomplishment for each performance category. Sustainability and the implementation of sustainable features is a very dynamic field. We have the expertise and the breadth of experienced resources to identify new or more comprehensive approaches for each of the categories. The TPZP team will create a matrix of performance measures and will utilize this matrix as a guide all through to the completion of the project. At the end of the design and construction process, we will utilize the plan and the reporting portal described in step seven of the IDP as part of the system certification closeout process to ensure that each item is addressed and accomplished as planned before certifying substantial completion.

With the opportunities listed in the plan and performance measures in mind, we will work closely with the CHSRA to investigate and evaluate any other sustainability metrics and measures.

Within 90 days of NTP, TPZP will submit the formal sustainability management plan, as required by contract. At a minimum, the sustainability management plan will accomplish the following:

- Demonstrate TPZP's efforts to exceed contract sustainability requirements during design and construction
- Establish a sustainability baseline
- Identify TPZP efforts to track and report site fuel, emissions, energy, water consumption, and waste materials

2.4.CONSTRUCTION WASTE MANAGEMENT PLAN

The TPZP team fully understands the expectations of the CHSRA for the construction waste management plan, and we will meet or exceed the requirements and improve the utilization of waste materials on the project. In addition, the TPZP team has reviewed the CalRecycle construction/demolition (C&D) waste management specifications and will incorporate those into the waste management plan. The TPZP team is also committed to seeking out suppliers of postindustrial waste products and products that contain some amount of waste diverted from landfills, and we will utilize those suppliers when feasible and available.

Waste management plans are an important part of improving the management of construction materials and helping to create sustainable communities. Building and demolition activities are integrating sustainability management techniques designed to protect the environment, save resources (including financial resources), and conserve energy.

A C&D waste management plan consists of identifying the types of debris that will be generated by the project and identifying how all waste streams will be handled. A successful waste management plan will contain the following information:

- Waste recycling, salvage, or reuse goals
- Estimated types and quantities of materials or waste generated from the project site
- Proposed and intended disposal methods for these materials
- Intended procedures for handling the materials or waste

REDUCE WASTE TO LANDFILL

The TPZP team will use the following opportunities to eliminate the generation of waste, to promote the efficient use of materials, and to employ energy-efficient solutions through our designs and innovations that will mutually achieve the sustainability goals listed above:

- After design development our ATC may eliminate the construction of the Jensen Trench, and therefore the generation of a large amount of material quantities, including a pump station.
- The TPZP team will use a secant-pile design that will reduce concrete and backfill quantities for the Fresno Trench.
- We will utilize precast bridge girders and MSE walls panels and closed abutments with MSE walls on bridges, which will reduce bridge lengths and reduce quantities of new construction and structure materials.
- A sustainable materials and design innovation is our downtown Fresno rail shoofly utilization of new high-speed train bridges/alignment, reducing the need for temporary shoofly structures.
- We have committed that topsoil disturbed by the project will be stockpiled and reused at the end of construction in key revegetation locations.
- We have the optimized earthwork to reduce both the amount and the transportation of earth borrow.
- The utilities, civil, and structures have been efficiently designed to reduce material quantities.
- The construction equipment will meet the stringent California Air Resources Board (CARB) equipment requirements and will optimize the use of automatic idle fuel reduction systems.
- We will use efficient trucking haul routes to reduce air pollution, greenhouse gases and neighborhood disruptions.
- The TPZP team has optimized traffic management through the MOT design and communications plan, which will reduce local traffic disruptions, emissions, and idling.
- We will use energy-efficient street lights and traffic signals on the project.

TPZP's construction and demolition (C&D) waste management plan will meet the goals specified in the RFP in terms of the waste diversion and pollution prevention by following a 3-R strategy to reduce the project's waste, in this order:

REDUCE	The TPZP team will look for ways that C&D waste can be reduced by identifying potential C&D wastes early in the design process.
REUSE	The TPZP team will identify waste that can be salvaged for reuse on the current project or on another project or that can be donated.
RECYCLE	The TPZP team will determine which C&D materials can be recycled.

- Detailed instructions for the subcontractors and laborers on how to separate or collect the materials at the job site
- Method for tracking and reporting on the volumes and disposition of the materials

Identifying potential waste early in the design process decreases waste generated during construction. If you don't create waste, you don't have to plan how to reuse or recycle it. We will be able to reuse all asphalt and concrete waste generated and will crush these materials on-site and repurpose them into application on the project.

The specific goals for this project set forth by the CHSRA are to recycle or salvage a minimum of 75 percent of construction waste and 100 percent of steel and concrete demolition waste. We will meet these goals. We will perform an analysis for recycling and separating the following waste materials:

- Asphalt and concrete paving
- Clean dimensional wood
- Beverage and food containers
- Brick and CMU
- Ferrous and nonferrous metals
- Recyclable plastic
- Gypsum wallboard
- Cardboard
- Ceiling tile
- Carpeting
- Glass
- Used equipment oil

The plan will identify the reuse, recycling, and processing facilities that will be receiving the recovered materials. If some of the materials will be donated, we will describe the process and identify the organizations that may receive the materials. For example, we have identified that one of the facilities to receive C&D materials in Fresno County is the Habitat for Humanity Restore.

In order to effectively implement the C&D waste management plan, it will be distributed and adhered to by all subcontractors and other jobsite personnel during the construction of this project. The TPZP team will implement the plan by discussing the goals and issues as part of subcontractor coordination meetings and will document this plan through the course of construction activities. We will review the plan requirements, waste handling procedures, locations of dumpsters/bins, waste segregation requirements, and reporting and enforcement requirements throughout the construction phase of the project.

2.5.EXAMPLES OF SUSTAINABILITY

Samplings of projects that exemplify our commitment to sustainability are highlighted below.

Table 2-16: Examples of Sustainability

Project Name	Recycling	Energy Use Reduction	Stormwater	Water Efficiency and Green	Sustainability Management
CityCenter	◉	◉	◉	◉	
SH 130 Segments 5 & 6		◉		◉	
SR 532			◉		
Loop 12	◉	◉		◉	
Mid-City Exposition LRT		◉	◉	◉	
DFW Connector	◉	◉		◉	
LAX Runway	◉				
MIA Mover APM		◉	◉	◉	

CityCenter – Tutor Perini constructed $6.2 billion CityCenter, one of the world's largest environmentally-sustainable developments. The U.S. Green Building Council awarded the 67-acre urban development project with 6 LEED Gold certificates. Tutor Perini recycled or reused of more than 80 percent of the imploded Boardwalk Hotel and Casino. This included doors, hardware, scrap steel, other metals and carpet sold to resellers; and broken tiles, concrete and asphalt taken off-site, crushed and made ready for reuse as backfill or underlayment. Salvaged toilets and countertops were donated for reuse. More than 82 tons of used wood was donated to the local Carpenters Apprenticeship training center. Also, a Tutor Perini subcontractor used a B20 blend of biodiesel in their equipment for site work and excavation. Tutor Perini tracked and reported totals of biodiesel used, which resulted in the award of a LEED Innovation Credit for reducing carbon emissions and utilizing local yellow food grease which is otherwise sent to a landfill.

TxDOT SH 130 Segments 5 & 6 Design Build – This $972 million design-build project was constructed by Texas Highway Constructors (joint venture team with Zachry). The SH 130 Segments 5 & 6 project consisted of the design and construction of 41 miles of new toll road, 74 bridge structures, three interchanges, more than 3.5 million square yards of asphalt pavement, and 15 million cubic yards of earthwork grading. Sustainable project and back office culture, the use of new technologies, energy-efficient systems, the reduction of construction area limits, the use of energy-efficient equipment, the reduction of required ROW, and optimized roadway profiles with a posted speed limit of 85 miles per hour, yielding the reduction of long-term energy consumption, illustrate the sustainability efforts of the team. In addition, Zachry incorporated the re-use of recycled concrete, asphalt, and aggregates in permanent construction.

SR 532 – The Washington state SR 532 improvement project demonstrates Parsons capabilities to deliver innovative and sustainable solutions in a challenging environment. The project area contained 64 different wetlands and 16 different jurisdictional ditches. We prevented disturbance of freshwater wetlands and streams, modifying the designs of retaining walls, slopes, and ditches along the project corridor, used bioswales instead of scuppers on the bridge, steepened slopes to avoid wetlands & buffers and used a media filter drain, which lead to excellent water quality treatment with a minimum footprint and no untreated water returned to the river.

Loop 12 – Zachry optimized recycled materials to construct the TxDOT $238 million Loop 12 freeway expansion project located in Irving, Texas. Zachry has proven expertise in the handling of recycled materials by crushing, screening and blending to meet required design and construction standards. Zachry optimized the use of recycled materials by processing the demolished concrete roadway, curb and gutter, and sidewalks, as well as a large area of asphalt pavement. This recycling plan eliminated a significant volume of new material with the use of the recycled concrete material from the demolished Dallas Cowboys Stadium that was located adjacent to the Loop 12 corridor. These recycling methods reduced long truck hauls and heavy equipment hours, significantly reducing CO2 emissions and eliminated consumption of new materials — thus reducing the carbon footprint of the project. Zachry also followed its standard recycle policy to optimize the reuse of materials where possible. This includes recycling equipment oils, scrap metals, paper and cardboard. Further, Zachry's late model equipment fleet is equipped with automatic idle to significantly reduce fuel consumption and exhaust emissions.

Mid-City Exposition Light Rail Transit – The $868 million Mid-City Exposition Light Rail Transit system included a Parsons-designed storage and inspection (S&I) facility. The main building for this facility is the office/yard control building. In cooperation with the client and the operating agency, Parsons established the goal that this building would be LEED certified in order to implement the sustainability goals of the agency and to be consistent with the core values of Parsons. The team integrated energy-efficient systems and control mechanisms, such as passive sun-shading devices, which resulted in a building designed to obtain an LEED Silver rating. Photovoltaic panels, LED lights, natural ventilation, the reduction of potable water consumption, and daylighting for 90 percent of all occupied spaces contribute to making this building sustainably innovative. The building is designed as a steel frame structure, with 95 percent recycled content steel, clad in aluminum panels, with a glass curtain wall system. Materials were chosen that took advantage of recycled and recyclable content, such as rubber tile carpet, low-VOC paints, and sealed concrete floors.

DFW Connector – The DFW Connector is said to be one of the most complex highway projects to be built in the Dallas Metroplex. Zachry's Environmental Manger was involved throughout the early development of the project planning and during the project execution phase. The Zachry team optimized the use of recycled concrete and asphalt materials generated from the demolished roadway and old bridges. These recycled materials eliminated the consumption of more than 200,000 cubic yards of new material used to construct portions of the new highway. Zachry also eliminated approximately 17,500 large truck loads — the equivalent of 24 tons per load — being hauled a long distance from off-site. This significantly reduced heavy equipment hours and relevant CO2 emissions, and lowered the final carbon footprint of this major project. Further, Zachry's modern automated idle system fitted on equipment saved more than 145,000 gallons of fuel.

LAX Runway 25L Relocation and Centerline Taxiway – This project consisted almost entirely of site improvements. Key to Tutor Perini's success, under the direction of Steve Pavoggi, was maintaining the right pace and sequencing of operations to ensure the proper flow of construction, from demolition and excavation to grading and placement of concrete. This included the removal and recycled use of 316,000 square yards of asphalt pavement and 276,000 square yards of Portland cement concrete pavement (PCCP). A crusher was installed on-site to process demolished material into processed miscellaneous base for use in the new construction. Recycling the material reduced the number of vehicles and amount of fuel necessary to remove material from the project site, as well as the delivery of new materials; thus minimizing impact to the surrounding community and the environment.

Additionally, owner-provided recycled water was used as dust control in order to promote water efficiency.

MIA Mover Automated People Mover System – Parsons and its construction joint venture partner developed a detailed and robust program to meet the owner's goal of making the $259 million project Miami International Airport's first certified LEED project. The team engaged project stakeholders and the community and worked collaboratively to develop design and construction practices to ensure that the project serves as a local benchmark for sustainability. Parsons' innovative design offset 70 percent of the station's energy consumption by two years with the purchase of renewable energy credits, included parking spaces for low-emitting vehicles and bike racks and changing rooms for full-time occupants, significantly reduced water consumption (by 30 percent), generated a minimum energy cost savings of 14 percent by increasing energy efficiency and decreasing the amount of electricity used, and provided for the recycling of 75 percent of the construction debris.

2.6. PRIORITY LIST OF RIGHT-OF-WAY PARCELS TO BE ACQUIRED

TPZP has demonstrated experience adapting to tight schedules, and we will accomplish this again through early design submittals, construction workarounds, and acceleration, if needed. Our three-segment approach will enhance flexibility. The CHSRA will acquire all ROW property necessary for the project with the exception of temporary easements not identified in the ROW acquisition plan. The ROW acquisition plan, found in Book 3, Part E, Subpart 4, indicates those parcels being acquired for the project. TPZP submitted Form I on May 18, 2012, which presented our initial list of critical ROW parcel dates. This is also included in Table 2-17, below.

Table 2-17: List of Critical ROW Parcels **(to be amended by Addendum 9, Book 3, Part E, Subpart 4)**

Construction Critical Parcels/ Stations	Parcels Description	Proposed Required Acquisition Date	Comments
Sta 2065+00-2080+22	All within ROW	Within 180 Days of NTP	North of Fresno River
Sta 2080+22-2155+00	All within ROW	At Notice to Proceed	Fresno River Crossing
Sta 2155+00-2695+00	All within ROW	Within 180 days of NTP	North of San Joaquin River Crossing
Sta 2695+00-2740+55	All within ROW	At Notice to Proceed	San Joaquin River Crossing-Viaduct
Sta 1713+98-1801+62 BK	All within ROW	At Notice to Proceed	Change in Stationing
Sta 10535+00AH-10890+00	All within ROW	Within 90 days of NTP	North of Fresno Trench
Sta 10890+00-10970+00	All within ROW	At Notice to Proceed	Fresno Trench
Sta 10970+00-11030+00	All within ROW	Within 90 days of NTP	South of Fresno Trench
Sta 317+25-365+00	All within ROW	Within 90 days of NTP	Change in Stationing
Sta 365+00-421+00	All within ROW	At Notice to Proceed	Jensen Trench
Sta 421 +00-520+00	All within ROW	Within 90 days of NTP	SR 99 - Cedar Ave. Crossing-Viaduct
Sta 520+00-587+25	All within ROW	Within 180 days of NTP	Central/American Ave.

David Carlson, CSR-P

Sustainability Advisor

PARSONS

Experience Profile

David Carlson is director of sustainable development and has more than 25 years of environmental policy development and implementation experience with the U.S. Environmental Protection Agency (EPA) and Federal Highway Administration (FHWA). As director of sustainable development, he focuses on the oversight, tracking, and growth of key sustainability service offerings to government transportation agencies and private transportation providers and the enhancement of internal sustainability programs. David is a nationally recognized leader who brings a perspective based on direct experience and a deep understanding of the best sustainability practices. He has a thorough knowledge of many state and federal programs, agency structures, and operations. David served as a senior environmental protection specialist for the FHWA where he served as the lead for the Sustainable Transport and Climate Change team, directed the Context Sensitive Solutions (CSS) National Dialog, and was the technical manager for the sustainable roads evaluation system. David also supported the U.S. Department of Housing and Urban Development (HUD), Department of Transportation (DOT), and EPA Sustainable Communities Partnership and co-authored the federal Sustainable Site recommendations to the White House.

As director of sustainable development for Parsons, David Carlson focuses on the oversight, tracking, and growth of key sustainability service offerings to government transportation agencies and private transportation providers, as well as the enhancement of internal sustainability programs. He directed and delivered a training program on the Parsons Sustainability Handbook. David is the Chair of the Corporate Sustainability working group. He created and developed Parsons' Dynamically Green Transportation program, which highlights the connections between mobility, ecology, and community, and it refers to the umbrella of techniques and practices we utilize to deliver sustainable transportation solutions, such as context sensitive solutions, complete streets, and low impact development.

State Transportation Liaison Funded Positions Study – David Carlson directed the development of the State Transportation Liaison Funded Positions Study, which entailed assessing trends in the use of funded positions and providing recommendations to State departments of transportation and resource agencies to support more effective utilization of these programs. The study revealed common benefits, challenges, and decision-making steps that are involved in developing and managing funded positions programs. He also developed the interview guide for the different State department of transportation and resource agency managers and the resource agency staff, led and facilitated the interviews, and co-wrote and edited the final report.

Sustainability Highways Self Evaluation Tool – David Carlson served as the project manager for the Sustainable Highways Self evaluation tool. The purpose of the project was to develop a web-based tool that would provide guidance and technical assistance for State DOTs to evaluate and choose sustainable solutions in projects and programs. He directed the team and facilitated

Unique Qualifications

- More than 25 years of environmental policy development and implementation experience with the U.S. EPA and FHWA
- Nationally recognized expert in sustainability best practices
- Served as the project manager for the Sustainable Highways Self-Evaluation Tool, a web-based application to provide technical guidance to transportation agencies on sustainability best practices

Years of Experience

25

Education

Bachelor of Science, Natural Resource Studies, University of Massachusetts-Amherst, 1988

Certification

CSR Practitioner, Centre for Sustainable Energy

an internal working group of advisors. David also facilitated two roundtables of state DOT and resource agency staff and managers to solicit feedback on what appropriate criteria and measures should be considered as part of the tool. He worked with the team to establish the web based platform for how the tool would function and the developed the preliminary criteria and performance measures that became the basis for the tool. The tool was released for public comment in October of 2010.

Professional Experience

Federal Highway Administration, Senior Environmental Protection Specialist

David Carlson served on the new Sustainable Transport and Climate Change Team for the Federal Highway Administration. He developed and implemented environmental policy and programs on both a national basis and for a set group of states. The major areas of policy and program development entailed context sensitive solutions, sustainability, National Environmental Policy Act (NEPA) analysis and project development, planning and environment linkages, greenhouse gas (GHG) emission reduction, and climate change adaptation.

U.S. Environmental Protection Agency, Region 2, Life Scientist\Environmental Protection Specialist

David Carlson served as the senior reviewer for NEPA's regional office in New York City and transportation liaison for environmental reviews of all major capital projects, including the Lower Manhattan Recovery Transportation projects and the World Trade Center redevelopment. He also reviewed Nuclear Regulatory Commission (NRC) nuclear power plant relicensing and Park Service and Forest Service NEPA documents. David provided oversight of the EPA environmental documentation.

U.S. Environmental Protection Agency, Region 9, Life Scientist

David Carlson began in air enforcement. He developed and enforced the first air toxics rules and Title V permits. David later transitioned to project reviewer for the NEPA program in California, Arizona, Nevada, and Hawaii.

3. Anticipated Problems and Proposed Solutions

3. Anticipated Problems and Proposed Solutions

3.1. POTENTIAL RESOURCE SHORTFALLS AND MITIGATION MEASURES

The potential for critical resource shortfalls is a very minor risk to the California High-Speed Rail Initial Construction Section, Construction Package 1 (CAHSR CP1) project. The current environment in the Central Valley will provide ample materials and labor. Using the local presence of California-based Tutor Perini/Zachry/Parsons, a Joint Venture (TPZP), our team will mitigate any associated resource risks through proven mitigation measures. TPZP has identified potential resource shortages and proposed mitigation measures in Table 3-1 to be responsive to the RFP. See Table 3-2 for major risk issues on the project.

3.2. COMMUNITY COORDINATION CHALLENGES

Identifying, prioritizing, mitigating, and resolving construction issues is critical to the success of the project and will set the tone for future initial construction sections. As discussed in Section 2, Public Involvement Plan, community relations are a major priority for TPZP.

Our commitment to the California High-Speed Rail Authority (CHSRA) and our stakeholder partners is to proactively consider, communicate, and address problems before they arise, and when they are presented, to resolve these issues in the most equitable manner possible for all stakeholders. We realize that the burdens placed on the community should be considered throughout the duration of the project and should be evaluated to be

Table 3-1: Potential Resource Shortages and Proposed Mitigation

Anticipated Resource Shortfall	Proposed Mitigation Measure
Labor Availability – TPZP believes that quality labor will be available within the time required, due to the lack of significant projects within the region and the general economy being depressed within recent years. TPZP will promote the creation of local jobs to improve the economy of this region and will complement local labor resources with those from adjoining communities when peak labor needs occur.	• TPZP will continue to utilize a resource-loaded schedule that will review man-loading requirements early in the project. This will promote the creation of local jobs and allow sufficient time for all trades to provide adequate skilled craft when required. If during the construction process any short term labor short-falls occur, the TPZP team's local knowledge and previous work relationships will be able to fulfill the needs of critical work elements quickly. • TPZP is local and understands current and potential future market conditions and the potential for shortage(s). TPZP will establish and implement early hiring procedures that allow advance notice and will implement them using a streamlined onboarding orientation process. • TPZP will rely on our local California presence within the regional market, and will share skilled resources between projects. TPZP will optimize project schedules and resource levels to balance required labor needs.
Qualified Subcontractor/ Subconsultant Availability – The availability of quality subcontractors and subconsultants should not be an issue to fulfill meaningful scope on the project. TPZP plans to the meet these needs almost entirely from the region and state of California. TPZP recognizes the 30 percent small business (SB) project goal and is committed to achieving that goal.	• TPZP will continue to aggressively solicit the participation of local and regional subcontractors/ subconsultants. We will ensure that each respective subcontractor/subconsultant's expertise is incorporated into the project. • We will manage and coordinate with each subcontractor/subconsultant as if it were our own force, and we will provide mentoring, including proactive approaches to utilizing tools such as auditing payroll, lien release, prompt payment, and joint checks. • TPZP will offer project-wide training for all active subcontractors/subconsultants. Training will include, but not be limited to, safety, quality, business, and construction means and methods. • TPZP will require the active attendance of subcontractors/subconsultants in weekly planning and coordination meetings. We will offer access to a staff subcontractor coordinator in order to provide continuity in the management process. • TPZP will continue to package subcontracts into manageable scopes of work and will implement a prequalification process. This process will ensure the participation of qualified subcontractors/subconsultants and will provide appropriate workloads.

prevented whenever possible. These issues could include financial loss regarding business revenue and/or a decrease in property value.

Solutions for Language/Geographic/Technological Barriers – Tutor Perini/Parsons worked closely with the Alameda Corridor Transportation Authority to provide an extensive and coordinated community outreach program, including web information, messaging on community bulletin boards, monthly project update sheets in four languages, regular meetings with local groups, city council presentations, and other steps normal to transportation projects. TPZP will implement a variety of communication methods on the CAHSR CP1 project that will address different stakeholders' needs, including, but not limited to, the following:

- Promoting participation by interested parties and historically isolated communities
- Ensuring clear and convenient methods of communication and opportunities for public input
- Ensuring that the community is informed about activities in an open, fair, equitable, and timely manner
- Preparing materials that present the project in lay terms
- Providing for multicultural, multilingual, fully accessible, economically-diverse participation for all stakeholders
- Developing multilingual outreach tools and providing on-site translation, as needed
- Collaborating with all stakeholders to implement a variety of outreach methods to provide convenient participation options and means for access to real-time project information
- Providing easily accessible means for the stakeholders to communicate and access real time project information
- Ensuring constant communication with a broad-based and diverse group of stakeholders (e.g., business, labor, transit, environmental organizations, interest groups, community based organizations, non-profits, faith-based organizations, neighborhood groups, Lao/Hmong/Spanish communities, etc.)
- Implementing a variety of outreach tools (e.g., project hotline, stakeholder project site tours, video presentations, display advertising, project newsletters, public service announcements, local news outlets, the *Fresno Bee,* the *Madera Tribune,* the *Business Journal,* KMJ radio, Comcast Newsmakers, Hmong radio, Univision [Spanish TV], etc.)
- Notifying the public via e-mail, website, mailing, Facebook, Twitter, blogs, flyer distribution/door-to-door campaigns, media outreach, advertisements, etc.
- Informing, educating, and recording meaningful input for real-time feedback

Conflicts and Tensions/Implement and Communicate Clear Resolution Process – TPZP is also keenly aware that despite best efforts to be proactive and communicative regarding construction issues, problems will arise. The TPZP team will ensure that there is a clear resolution process with multiple points of access for communication that all members can access and that will find an equitable solution for all stakeholders impacted, including our community partners and the CHSRA.

The steps to resolve these issues will include the following:

- Stakeholder roundtable meetings to completely understand the nature of the conflict
- Maintaining open lines of communication and receptivity to ideas and solutions from the public/stakeholders
- Commitment to a reasonable timeline to address and resolve these issues in advance
- Creatively exploring all options and presenting them to the impacted stakeholders
- Evaluating all resolution solutions offered/suggested and drawing upon the extensive experience the TPZP team has gained on other civil projects
- Bringing in trusted third-party dispute resolution leaders if necessary
- Documenting efforts to resolve the issues
- Delivering presentations to local governing authorities on the issues being addressed and the efforts to resolve them

Effective Communication throughout the Central Valley Corridor

TPZP has extensive experience working with a wide range of audiences throughout the project corridor, and we will be sensitive as to how they receive information.

Addressing New and Existing Issues/Ensuring an Active Feedback Loop – To better understand the communities' concerns and potential construction issues, TPZP will obtain feedback early in the process from stakeholders via a variety of outreach and communications strategies. General themes and specific issues will emerge from this feedback. Once feedback is evaluated, issues that cause the greatest concern and/or impact will be identified as priorities.

Safety Concerns/School Education Campaign – Educating students about the CAHSR CP1 project, anticipated construction activity, and safety measures helps develop a positive attitude among both students and parents regarding the project and possible safety concerns. It encourages community involvement that will contribute to the success of the project by teaching children about safety, why safety is an important issue, and how to practice individual safety measures near construction zones. These safety programs will be conducted with the hope that the children will share this information with their families and take responsibility for their personal safety. Informational packets can be developed to include project information, construction timeline/notices, safety tips, and other information on how to keep informed on project updates as they develop. TPZP can also develop activities for grade school students to further develop their interest in the project, including poster contests, engineering/construction career presentations, and field trips.

A relevant example from the Alameda Corridor Mid-Corridor Trench project was breaking the dangerous habit of hundreds of school children crossing the corridor on the way to school. The Tutor Perini/Parsons team worked with the schools directly to reach all parents and children through newsletters,

special school events, and the PTA. The most effective tool became the tens of thousands of pencils stenciled with safety messages and distributed through the schools to the students. The net result was that there were zero student injuries or incidents throughout construction.

Partnerships and Outreach Campaigns – Partnerships and outreach activities complement one another. Outreach is required to generate support and to create partnerships. In turn, partnerships are crucial to conducting further outreach and to sustaining the public information program. TPZP will develop and enhance existing relationships to ensure that the current support for the project is grown through individual and organized stakeholder project support. TPZP understands that a key component of maintaining success is obtaining support from stakeholder leaders and respected members of local communities. Additionally, TPZP will build partnerships with these stakeholder leaders, as they can serve as trusted voices within their respective communities, providing project updates and personally referring the public to additional communication resources. TPZP will also take advantage of high-profile events, such as community events and school programs, to distribute the latest project information and construction notices. For example, a booth could be staffed at major events to distribute information and to answer stakeholder questions.

3.3. DESIGN ISSUES

While design issues invariably arise in major projects, TPZP will utilize best practices to quickly facilitate their resolution. First is the early identification of issues so that they can be avoided entirely or resolved before they become more difficult. Once a design issue or potential issue arises, it must be clearly identified, understood, and addressed. The use of task forces to deal with specific project elements helps to quickly address design issues as soon as they arise. When necessary, the CHSRA and affected third-party stakeholders will be advised and become part of the team in addressing specific design issues.

Issues sometimes arise as part of the comment/review process. We will formally structure and document reviews to allow a smooth transition to the next design phase by using a comment form, disposition, and implementation procedure that will allow reviewers to easily determine the actions required and taken. The CHSRA will be invited to attend and participate in every design review. Stakeholder review requirements are included in the contract specifications and will be further described in the design quality management plan.

TPZP will co-locate our design team in a Fresno office with the CHSRA's staff to facilitate communication and coordination. Weekly meetings and even more frequent over-the-shoulder reviews will be scheduled during design to ensure that the design packages incorporate all the requirements of the project and that they reflect the work that the CHSRA has done in reaching consensus on the design with third parties. Issues that arise during design will typically be resolved informally as part of these meetings, reviews, and task force recommendations.

Design issues that cannot be resolved in our normal design review process will be brought to coordination meetings for resolution. In general, design issues can be easily resolved; an important element of this ease is that Chris Clark (our Design Manager), Doug Slakey (Civil Team Lead), Judith Rosso-

The Tutor Perini/Parsons team worked with the schools directly to reach all parents and children affected by work on the Alameda Corridor Mid-Corridor Trench project through newsletters, special school events, and the PTA.

Mountin (Structures Team Lead), and Pat Porzillo (Alignment Team Lead) have developed good working relationships. As one of the CHSRA's regional consultants for the San Jose-to-Merced segment, Parsons' understanding of the history of the project's development will aid in making design decisions that are respectful of the work invested by the CHSRA and the preliminary design teams, and of the input provided by local stakeholders.

In the unlikely event that a design issue cannot be resolved at the design-build coordinator level, the Project Manager/Director, Josh Randall, will provide the team with direction. Our intention is to highlight conflicts early, to resolve conflicts at the lowest level consistent with design direction and CHSRA guidance, and to involve the CHSRA on policy or third-party issues as soon as feasible. The design team will provide heads-up notice of potential issues to make the best use of guidance from the CHSRA.

3.4. CONSTRUCTION ISSUES

The partnering process will draw on the strengths of each stakeholder organization to help identify and achieve reciprocal goals, with the ultimate goal being the completion of quality work on time, safely, within budget, and to the expectations of the CHSRA.

The top five construction risks and mitigation are listed in Table 3-2.

The TPZP team has found that the primary way to avoid disputes is to identify and resolve issues at their lowest level in an open, cooperative environment. For the CAHSR CP1 project, this will be accomplished through

Table 3-2: Construction Risks and Mitigation Strategies

Potential Risk	Strategies to Mitigate Risk
Delayed CHSRA right-of-way (ROW) acquisition dates that don't match the general contractor's submitted schedule	• Extremely close monitoring of availability dates (up to November 24, 2016) expected from the CHSRA to ensure contract compliance and management schedule implications. • Coordination with all contractors on various contracts (e.g., Caltrans and SR 99 work) through the CHSRA to make interactive work as seamless as possible. • Provide a single point of contact, our Project Manager/Director, for coordination and communication with the CHSRA and other contractors.
Third-party utilities exceeding utility schedule durations at street crossings	• Design reviews and approvals by the third-party utilities are built into the schedule to ensure schedule compliance through coordination, approvals, and notification well in advance of actual work windows. • Provide a Utility Coordinator, Wayne Karlik, to serve as the single point of contact to the third-party utilities for coordination and communications and to facilitate approvals. • One-on-one partnering and participation at task-force meetings to elevate and resolve issues.
Union Pacific Railroad (UPRR)/ BNSF interface work in conjunction with active track service	• Design reviews and approvals by UPRR/BNSF are built into the schedule to ensure schedule compliance through coordination, approvals, and notification well in advance of actual work windows. • Close management of right-of-entry process to ensure that access to UPRR/BNSF ROW, durations and hours, and type and size of crews is adequate.
Timely review and approvals by the stakeholders	• Design reviews and approvals built into the schedule to ensure compliance through coordination, approvals, and notification well in advance of actual work windows. • Provide jurisdictions with single point of contact — our Public Involvement/Stakeholder Manager, Edgar Gutierrez — for coordination and communications and to facilitate approvals. • Partnering, over-the-shoulder reviews in the project office, and participation in task-force meetings to elevate and resolve issues.
Handling contaminated materials, soils, and water	• Designation of an Environmental Compliance Manager, Macie Cleary, reporting to our Quality Manager, to identify and direct handling, storage, and disposal of contaminated soil and water, given regulatory requirements. • Identification of the nature and extent of contamination in soils and groundwater within work limits as early as possible. • Develop a plan for handling, storage, and disposal of waste before construction begins. • Develop contingency plans for needed fill material if it is found that excavated material cannot be reused.

partnering, which is particularly effective when it involves all participants. Partnering will form the foundation for an effective project culture where working relationships, project goals, and expectations are established from the outset. Partnering will lead to an understanding of goals and objectives for the project and to open communication and trust among stakeholders.

The TPZP team is fully supportive of the intent outlined in RFP Book 2, Part B, Section 50, including the following:

- Post-award partnering workshop.
- Implement an issue resolution ladder.
- Institute a partnering implementation plan.
- Conduct facilitated executive partnering sessions.
- Conduct partnering training for all parties.
- Conduct partnering evaluations.
- Include partnering language in subcontracts.

The following are important partnering goals:

- For TPZP and the CHSRA to work as partners
- To avoid confrontation
- A mutual understanding of the contract work
- An atmosphere of trust and communication

The CAHSR partnering policy facilitates a partnering implementation plan. TPZP will promote partnering arrangements with the CHSRA and will use the provisional sum for the expenses of a professional facilitator and meetings. TPZP will strongly encourage the participation of all subcontractors, regardless of tier, in partnering meetings and evaluations.

TPZP will work closely with the CHSRA to develop and implement an approach that will maximize the involvement of all stakeholders in the project. The process will begin at the outset and will continue, with regular meetings, until project completion. Primary members of the partnership will be the CHSRA, stakeholders, TPZP, and our subcontractors and subconsultants. The partnering process will draw on the strengths of each organization to help identify and achieve reciprocal goals, with the ultimate goal being the completion of quality work on time, within budget, and to the expectations of the CHSRA. A primary consideration will be the prompt and equitable resolution of issues affecting the conduct of the work and the rights and responsibilities of the respective parties.

Table 3-3: Design-Build Challenges and Solutions

Design-Build Challenge	Solution
Aligning interests between the contractor and designer	The lead design firm, Parsons, is also a member of the design-build joint venture (DBJV).
Conflicting priorities during design and construction integration	Construction leads and design leads will co-chair the different task forces, ensuring that both disciplines are evenly integrated. A design-build coordinator will resolve any issues that may arise.
Unconstructible design aspects and quality/consistency among design firms	Thorough constructability reviews before design advancement at each stage of design completion.
Development of early-release packages	The design schedule will be fully integrated into the overall project schedule, and the design team will be appropriately staffed to meet schedule deadlines.
Managing third-party input	Any affected third parties will be invited to task-force meetings. Separate outreach meetings will also be held.
Communications among all entities involved	The co-location of construction personnel, designers, and CHSRA representatives allows for instant communication and proactive issue resolution.
Lack of resources	Our joint venture executive committee will monitor resources and allocate them as necessary.
Managing large numbers of subcontractors and meeting SB/DBE/DVBE goals	Establish a robust procurement department that includes an SB/DBE /DVBE department to identify subcontracting opportunities, manage outreach efforts, and conduct training.

TPZP understands that partnering will be particularly important for the project because of the variety of stakeholders involved, other than the CHSRA and the TPZP team, such as the communities, public agencies, railroads, businesses, public interest groups, and others having a potential impact on the project. Our experience with partnering programs across the United States is that good partnering among the various participant and stakeholder groups leads to a clear understanding of mutual goals and objectives.

TPZP partner Zachry recognizes the overarching benefits of partnering, as demonstrated with significant benefits implemented throughout the construction of the $288 million High Five Interchange project in Dallas. Partnering allowed Zachry to develop and utilize innovative solutions that had significant benefits, as demonstrated with a 13-month early completion and receipt of numerous awards. Zachry teamed with TxDOT early with a focused effort creating a unified approach to achieve the project goals. Both TxDOT and Zachry focused on each specific element of the project, through each phase of design, optimized construction methods, safety to the public and workers, deliver the highest level of quality, and minimize impacts and disruption to the traveling public with over 150,000 vehicles passing through the project each day.

Partnering will be bilateral, and participation will be required; the process is based on personal commitments from senior managers of the partnership. TPZP and the CHSRA will conduct an initial partnering workshop with key staff and the major subcontractors. Follow-up workshops may be held periodically as new participants are added. The regular partnering sessions will focus on working together to smoothly disseminate project information and process payments, change orders, requests for information, delay requests, substitutions, and other typical interactions and interfaces between TPZP, the CHSRA, and subcontractors and subconsultants. The sessions will establish channels of communication to maximize the productivity of everyone working on the project, while minimizing conflict.

> TPZP has adequately accounted for price escalation and other associated escalators within the cost proposal. In cases where TPZP was not able to secure firm-fixed pricing, proper contingency was accounted for within the price proposal.

The objectives of the partnering process are effective and efficient performance intended to achieve timely and efficient project implementation and completion and to create mutual trust and respect for each party's respective roles in the design-build process, while recognizing the respective risks inherent in those roles.

Any dispute that may arise within the partnering team will be mutually resolved through best efforts and good faith negotiations between the authorized representatives. During the performance of a contract, issues are likely to arise, as they do with all projects. The goal is to informally resolve such disputes as early as possible.

We will resolve disputes at the lowest possible level. An issues resolution ladder will be mutually developed. Unresolved issues will be moved up the ladder until they are resolved. By using this method, with the ultimate goal of keeping an issue from becoming a dispute, issues are not allowed to linger and drain valuable staff time through arguing and posturing.

If there is a dispute that cannot be resolved by the parties, it will be submitted to the dispute resolution board (DRB), as stated in RFP Book 2, Part B, Section 51 – Disputes. This is viewed as a last resort; it will not be used as a means of avoiding issues or preventing us from making tough decisions and resolving the dispute. Long, drawn-out disputes are not beneficial to a project. We believe in resolving issues quickly and keeping the project moving.

TPZP will use the issues resolution ladder to identify and resolve, or elevate the issue, before it has an impact on cost or time on the CAHSR CP1 project. The TPZP team will promote the following 10 steps to issue resolution:

10 Steps to Issue Resolution

1. Identify and clarify the issue.
2. Gather the facts.
3. Determine who needs to be involved.
4. Ensure uninterrupted time.
5. Communicate and ask input from those involved.
6. Brainstorm resolutions and prioritize.
7. Decide on a resolution at the operational level.
8. Record agreements and action items.
9. Use the resolution ladder, if needed.
10. Bring the final decision back to those involved.

3.5. ISSUES RAISED BY THE TEAM

The design-build approach offers many benefits, including accelerated delivery. The combined design-build experience that TPZP offers will ensure the early resolution of design-build issues. The TPZP response to the CAHSR CP1 statement of qualifications (SOQ) addressed design-build challenges in Section B.2. Table 3-3 indicates some of the typical challenges that occur in a design-build environment, along with our solutions to these challenges. We consider these risks minor and have identified the top five construction risks in Table 3-2.

3.6. COMMODITIES RISK

Before the submittal of our CAHSR CP1 proposal, the TPZP executive committee, project management team, estimating team(s), and procurement team(s) thoroughly identified, analyzed, reviewed, quantified, and accounted for all potential commodity risks, including those potential risks identified by the CHSRA. We consider these items to be minor in nature. See Table 3-2 for major risk issues on the project. Analyzed commodity risks included, but were not limited to, the following:

- Construction fuel (diesel)
- Construction fuel (gasoline)
- Structural steel
- Reinforcing steel
- Cement
- Aggregates
- Earthwork/borrow

Three fundamental elements were the baseline of the overall assessment: availability, supply, and price volatility.

In conducting the commodity risk analysis, TPZP consulted with construction economic experts at the national, regional, and local levels; subject matter experts within each commodity supply chain; and subject matter experts within the commodity manufacturing, producing, and fabricating industries. We also reviewed and analyzed past cost history and reviewed and analyzed current and futures market data.

To mitigate commodity risk(s), TPZP used the acquired information to quantify and account for the appropriate risk within the project price proposal; negotiate pre-purchase/purchase agreements with suppliers, vendors, and fabricators; negotiate pre-order/order agreements with suppliers, vendors, and fabricators; secure long-term escalator clauses; secure long-lead items; secure commodity source materials; and negotiate firm contracts with subcontractors and subconsultants.

As identified in the paragraphs that follow, TPZP has developed key strategies to mitigate impacts from volatile commodity markets, which will be implemented on the project. Strategy development the included the involvement of executive-level, project management, estimating, and procurement management, and will include their continued involvement through implementation. TPZP has identified material shortages and price/cost escalations as the greatest commodity risk exposure(s) for the project.

TPZP, along with our dedicated subcontractors and subconsultants, has secured firm pricing from select vendors and suppliers before award. TPZP has secured firm-fixed pricing for the required structural beams, reinforcing steel, aggregates, pipe, ready-mix concrete, precast concrete materials, and earthwork borrow materials.

TPZP has prospected several potential earthwork borrow source locations throughout the project alignment. The prospecting of these potential sources included firm supply commitments from earthwork borrow commodity owners, firm price agreements between the respective earthwork borrow commodity owner and TPZP, and preconstruction material source testing and analysis, including confirmation that earthwork borrow materials will meet contract specification criteria.

TPZP has adequately accounted for price escalation and other associated escalators within the cost proposal. In cases where TPZP was not able to secure firm-fixed pricing, adequate contingency was accounted for within the cost proposal.

TPZP has identified long-lead items, which will require early design completion. Early design completion will yield early shop drawing/material submittals, review(s), and approval(s), therefore leading to early material and product orders, providing timely delivery to the project. The TPZP design team is committed to early design package delivery.

Where appropriate, TPZP will offer prepayment of materials and products to the respective vendors and suppliers. Prepayment will mitigate the potential for cost price increases, eliminate escalation factors, secure and confirm manufacturing/fabrication schedule date(s), and secure/confirm material delivery dates(s).

Through combined efforts, TPZP will provide latitude of design while meeting CHSRA design criteria and project specifications. In short, TPZP will offer additional commodity mitigation through design flexibility.

4. Conceptual Engineering

4. Conceptual Engineering

4.1. DESIGN APPROACH, INCLUDING INTERFACING WITH CHSRA AND THIRD-PARTIES

Parsons, as lead designer of Tutor Perini/Zachry/Parsons, a Joint Venture (TPZP), has successfully completed the design of more than 64 design-build transportation projects over the last 20 years, with a total value of more than $20 billion. In doing so, the firm has developed an extensive set of best practices for the delivery of designs for design-build projects that achieve the objectives of owners, that are well-coordinated with construction, and that meet third-party requirements.

The TPZP design team will be led by Chris Clark, PE. As Design Manager, Chris will direct and oversee the design team, ensure timely delivery, and report to the TPZP Project Manager/Director, Josh Randall. Chris' experience includes more than 30 years of California highway and transit projects, design-build projects, and a number of grade-separation projects in the San Joaquin Valley. Parsons' design team has significant experience in California, specifically with grade separations, as demonstrated in Figure 4-1.

Chris Clark has more than 40 years of design and design management experience, 30 of those with Parsons. He has served as design manager or principal-in-charge on major transportation projects in California, including the new Carquinez Bridge, Caldecott Tunnel Fourth Bore, and most recently, the $1.25 billion TRIP/Bakersfield Program Management project.

4.1.1. Project Delivery Strategy

Reducing the Schedule to 48 Months

TPZP will deliver the CAHSR CP1 project consistent with our experience on complex, schedule-driven projects that segments and phases the work effort to minimize delays and to allow consistent work progress over the 48-month construction period to substantial completion.

Our project delivery strategy focuses on meeting key objectives and goals established by the CAHRA. We will deliver the CAHSR CP1 project on an aggressive schedule that segments and phases the work effort to minimize delays and allow consistent work progress during construction. With this approach, TPZP will deliver the entire project 180 days earlier than the required substantial completion date and we will deliver significant portions of the project earlier. Our organization has put an emphasis on quality, and we will commit all the resources necessary to deliver a quality product. This will be documented with a thorough program of self-certification, verification, and validation, and we will work closely with the Independent Checking and Independent Site Engineer to meet the CAHSRA's objectives for independent quality assurance.

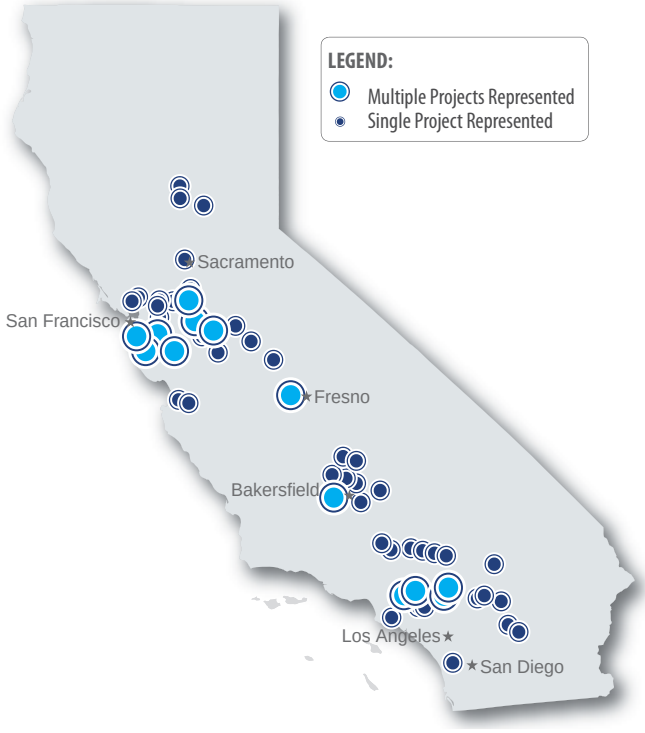
This delivery strategy includes correctly implementing the mitigation commitments that were developed during the environmental phase of CP1. We have dedicated an Environmental Compliance Manager, Macie Cleary, to oversee the monitoring of local, environmental and permit requirements during the course of construction. Both design and construction efforts will place an emphasis on minimizing negative environmental impacts, minimizing energy and water use, reducing emissions and consumption of fossil fuels, and reducing waste. We have established a project-wide organization, led by David Carlson, that will ensure that sustainability is considered in all our actions.

Through a statewide outreach program, TPZP has assembled a high-qualified team to meet the CHSRA's small business (SB), DBE and DVBE goals for the project, and we will aggressively manage this team to maximize opportunities for small business, disadvantaged businesses and disabled veteran-owned firms.

Design Staff Resources: For this project, Parsons draws upon its cadre of more than 800 transportation professionals in California, including 400 licensed professional engineers, to ensure that the design team has the staffing resources needed to meet TPZP's schedule requirements. In addition, we have identified a group of subcontractor firms to fill specific technical roles and to provide 400 additional design personnel to meet the staffing needs of this major undertaking. Key subcontractor firms and their respective roles and small business/minority business enterprise/women-owned business enterprise (SB/MBE/WBE) statuses are highlighted in Table 4-2.

California Design Team and Leads: To ensure consistency throughout the corridor, TPZP will assign discipline leads, whose responsibilities include developing project design manuals, assembling project design standards,

Figure 4-1: More Than 50 Years of Parsons' California Grade-Separation Experience (Partial List)



NOTES:
SPRR became part of UPRR in 1996
WPRR was acquired by the UPRR in 1983
AT&SF became BNSF in 1997

Alameda County – S. Verona Road UP (WPRR)	Milpitas – Abel Street OH (UPRR)
Albany – Buchanan St OH (SPRR)	Modesto – Kansas-Needham OH (UPRR)
Antioch – A Street OH (UPRR)	Montclair – Ramona Avenue OH (UPRR)
Antioch – Cavallo Road UP (SPRR)	Montclair – Monte Vista Ave UP (AT&SF)
Bakersfield – Chester Ave UP+ 9 more (UPRR/ BNSF)	Mountain View – San Antonio Blvd OH (SPRR)
Banning – Highland Springs Ave (UPRR)	Newark – Newark Blvd OH (SPRR)
Banning – 8th Street UP (UPRR)	Ontario – Mountain Avenue OH (SPRR & UPRR)
Carson – Carson Street OH (SPRR)	Ontario – Grove Avenue UP (UPRR)
Coachella – 50th Ave OH (UPRR)	Oroville – Bridge Street OH (WPRR)
Colton – Colton Cutoff (SPRR)	Oroville – Huntoon Street UP (WPRR)
Colton – N Street UP (AT&SF)	Oxnard – Third Street OH (SPRR)
Contra Costa Co – Nichols Road OH (SPRR)	Palmdale – Sierra Hwy UP (UPRR)
Contra Costa Co – Christie OH (BNSF)	Palmdale – Avenue S OH (UPRR)
Contra Costa County – Waterfront Rd. OH (SPRR)	Palmdale – 25th Street East UP (UPRR)
Fremont – Durham Rd OH (SPRR/WPRR)	Pittsburg – Railroad Ave UP & OH (AT&SF & SPRR
Fremont – Grimmer Blvd UP (SPRR/WPRR)	Pleasanton – Bernal Ave UP (WPRR)
Fremont – Pickering Avenue UP (SPRR)	Pleasanton – Valley Ave UP (WPRR)
Fresno – Marks-Shaw UP (BNSF)	Pleasanton – Valley Ave Ext. UP (UPRR)
Fresno – Fresno Street UP (SPRR)	Pleasanton – Del Valle Ave UP (UPRR)
Hayward – A Street OH (SPRR)	Pomona – Towne & White Ave UP (UPRR)
Indio – Monroe Street OH (SPRR)	Pomona – Roselawn Avenue OH (UPRR)
Kern County – Oak Creek Road OH (UPRR)	Rancho Cucamunga – Milliken Ave UP (AT&SF)
Lancaster – Avenue L OH (SPRR)	Richmond – Richmond Pkwy (AT&SF)
Lancaster – Avenue H OH (UPRR)	Riverside City – Fourteenth Street UP (UPRR)
Lancaster – Avenue L OH (UPRR)	Riverside County – Limonite Avenue UP (UPRR)
Lancaster – Avenue L OH (SPRR)	Salinas – Davis Rd OH (SPRR)
Livermore – North Mines Rd OH (UPRR)	Salinas – Market St UP (SPRR)
Livermore – Vasco Rd OH (UPRR)	San Bernardino – Mill Street OH (AT&SF)
Livermore – North P Street UP (UPRR)	San Bernardino County – Cherry Ave OH (AT&SF)
Livermore – Livermore Avenue UP (UPRR)	San Bernardino County – Haven Avenue (UPRR)
Livermore – East First Street OH (UPRR)	San Marcos – Twin Oaks Valley Road OH (AT&SF)
Livermore – Murrietta Blvd UP (UPRR)	San Mateo – Calif. Ave Ped Up (CailTrain)
Long Beach – Alameda Corridor (UPRR)	San Mateo County – 5th Avenue UP (JPB)
Milpitas – Calaveras Blvd OH (UPRR)	West Sacramento – Harbor Blvd UP (SPRR)
	Yuba County – Pasado Rd UP (WPRR)

and facilitating discipline coordination among all segments and design packages. These leads chair the discipline task-force meetings. Additionally, as an added value to the CHSRA and to ensure continuity post-construction, Chukwuma Umolu, PE, will serve as an alignment designer on the project before transitioning into his key position as the project Warranty Manager.

The structure of our California design team organization is shown in Figure 4-2. Some of our discipline leads, and other key staff, and their experience are shown in Table 4-1.

The discipline leads are responsible for the following:

- Coordinating activities of the discipline engineers
- Ensuring integration of design across disciplines
- Ensuring that design elements meet CHSRA and third-party requirements
- Ensuring integration for adjacent projects and future systems

Having segment managers responsible for the completion of construction packages and discipline leads responsible for the preparation and coordination of the technical content is a cost-effective way to deliver design packages to the construction team in the shortest time possible. This approach facilitates efficient changes while satisfying our quality standards and meeting CHSRA requirements.

Table 4-1: Design Leads' Experience

Lead Designer	Project Design Role	Years of Design Experience	Years of CA Design Experience
Chris Clark, PE	Design Manager	43	33
Doug Slakey, PE	Civil Team Lead	36	26
Judith Rosso-Mountin, PE	Structures Team Lead	15	15
Pat Porzillo	Alignment Team Lead	26	0
Steve Haines, PE	Structures Lead	19	15
Chukwuma Umolu, PE	Alignment Designer	28	26
Richard Bottcher, PE	Drainage Lead	30	23
Charles Lee, PE	Civil Designer	23	11
Rebecca Wong, PE	Structures Designer	6	6
John Bishop, PE	Structures Designer	21	21
Carla Vincent, PE	Lead Civil Designer	28	27
Irina Khavina, PE	Structures Designer	25	25
Gina Matesic, PE	Lead Specifications Writer	25	21

Task Force Strategy: Task-force meetings are our primary structured forum for coordination between the design and construction groups, and they are attended by design and construction representatives. Discipline leads will use task-force meetings to resolve identified issues left unresolved.

Table 4-2: Subconsultant Roles

Subconsultant (SB Status)	Summary of Services
AMEC	Geotechnical services for viaduct structure foundations. Additional subsurface explorations and laboratory testing.
CHS Consulting Group (SB/DBE)	Traffic engineering analysis, traffic signal design, maintenance of traffic plans.
Citadel CPM, Inc. (SB)	Project coordination, document control, and scheduling
Earth Mechanics, Inc. (SB/DBE)	Geotechnical services for grade-separation structures and trench foundations. Additional subsurface explorations and laboratory testing.
Environmental Science Associates	Preparation of monitoring plan, environmental compliance monitoring during construction.
Korea Rail Network Authority	Specialized expertise in high-speed train design and construction services.
Lee Andrews Group (SB/DBE)	Community outreach, SB strategy/plan, and SB/DVBE/DBE/MB Manager.
MGE Engineering, Inc.(SB/DBE)	Design of bridges and walls for roadway crossings.
OPAC Consulting Engineers, Inc. (SB/DBE)	Design of bridges and walls for roadway crossings.
Precision Civil Engineering, Inc. (SB)	Civil engineering, land survey/staking, biological permitting and planning.
Provost & Prichard	Utility coordination and design, liaison with flood control, irrigation districts, and cities and counties of Fresno and Madera.
Psomas	Field survey and photogrammetric mapping.
RailPros, Inc. (SB)	UPRR shoofly design, heavy railroad expertise.
Ruettgers and Schuler Civil Engineers	Railroad coordination and California Public Utilities Commission (CPUC) liaison assistance.
STV, Inc.	Independent checking engineer (ICE) and independent site engineer (ISE).
SYSTRA Consulting, Inc.	Embankment design, high-speed train structure criteria and detailing, structures.
Willdan Engineering	Planning, engineering, program management, inspection services, governmental outreach/strategy.
WKE, Inc. (SB)	Design of bridges and walls for roadway crossings.
WRECO (SB/DBE)	Drainage design, floodplain analysis.

Task Force Topics

TPZP will regularly discuss schedule, early construction needs, risks, cross-discipline coordination, packaging, plan content and format, constructability, sequencing and staging, quality, and conformance to contract requirements at the task-force meetings.

We will formally structure and document reviews to allow a smooth transition to the next design phase by using a comment form, disposition, and implementation procedure that will allow reviewers to easily determine the actions required and taken. The CHSRA will be invited to attend and participate in every design review. Stakeholder review requirements are included in the contract specifications and will be further described in the design quality management plan (DQMP).

Project Management Plan: We will submit for approval our project management plan (PMP), which establishes details for executing the work, within 60 days of receipt of NTP. The PMP will provide updated details of the management plan included in our proposal, while providing our entire organization established work processes and procedures for the control, coordination, and completion of design:

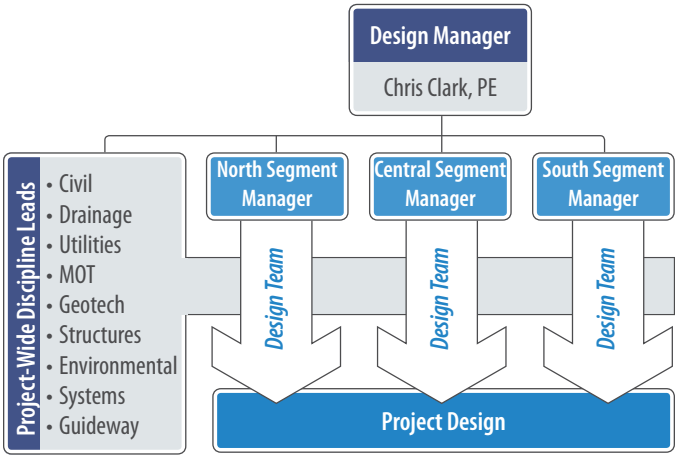
- Implementation of our quality management plan (QMP), including details of our quality control (QC), quality assurance (QA), verification and validation (V&V) and independent checking engineer/ independent site engineer (ICE/ISE) programs. See Section 5.
- Staffing plans for the management of quality activities. See Section 5.
- Testing, inspection, and audit processes and procedures. See Section 5.
- Implementation of cost and schedule control.
- Interfacing with the CAHSR, BNSF, the Union Pacific Railroad (UPRR), regulatory agencies, local municipalities, other third-party stakeholders, and the public.
- Implementation, management, and control of our safety and security certification process.
- Management and control of project documents and records.
- A demobilization plan that ensures adequate resources at all times.

The following are the main components of our mobilization strategy that begins upon notice to proceed (NTP):

- Mobilize key project technical and support staff to deliver our baseline delivery strategy, mobilization plan, and staff levels and to identify key issues.
- Complete and execute subcontracts, prioritized by schedule needs; include early NTPs for critical subcontractors.

The CHSRA has established a 30 percent SB goal for this project, and TPZP has, though a statewide outreach program, assembled a highly qualified design team that will meet the goal.

Figure 4-2: Design Team Organization



- Activate the facilities team for the build-out of the project office, including networking, servers, workstations, and software.
- Establish file organization, reference to computer-aided design (CAD) standard documents and design plans, design standards, and criteria documents.
- Develop an orientation package for staff joining the project.

During the office setup after NTP, work will continue from our local California home offices to mitigate any potential impact to the schedule.

Our assumptions for scheduling the mobilization of the design team include the following:

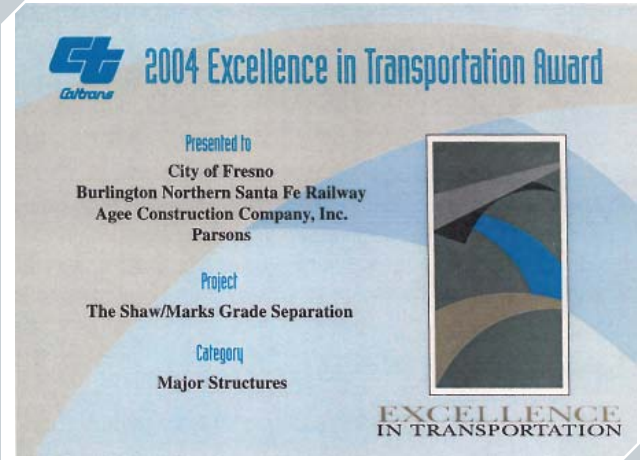
- Project office will be fully functioning by 30 days after NTP.
- Key project staff involved in the mobilization effort will begin their activities upon NTP.
- Advance NTPs are issued to critical subcontractors within 14 days after NTP, with fully executed subcontracts to follow. Mapping and geotech exploration will be the focus for early field work activities.
- Orientation package for staff will be available within 21 days following NTP.

Project Segmentation: The design of the CAHSR CP1 project will be managed in three geographic segments: North, Central, and South, as described in Section 2. This delivery strategy facilitates the following:

- Early start on construction for project elements on the critical path
- Expedited design reviews
- Efficient resource management
- Quality control and assurance

Since 2000, Parsons has worked on the California high-speed train system, including the preliminary plans for the San Jose-to-Merced segment. This experience working with the CHSRA has allowed us to develop strong working relationships.

Parsons designed the Shaw/Marks Grade Separation for the City of Fresno, which was awarded the Caltrans 2004 Excellence in Transportation Award, Major Structures category.



4.1.2. Design Coordination

All elements of the project design need prompt and detailed coordination to ensure success.

Design Interface with Construction: To help facilitate coordination between the design and the construction team, we have added a Design-Build Coordination Manager, Mark Jurica, and a team of design-build coordinators to our organization. With more than 25 years of transportation and design-build experience, Mark has led multiple design and engineering interfaces with construction efforts. Mark's professional experience includes the successful design interface with construction management on the $972 million TxDOT SH 130 Segments 5 & 6 project and the $154 million TxDOT SH 45 turnpike project. Mark and his team will provide over-the-shoulder review comments and constructability guidance as the design is developed while directing the design team as to when design is required to meet the construction schedule. This value-added position will ensure that the design is efficient, constructible, and will not require modifications once released for construction.

Co-location of design and construction personnel will enable seamless interaction between the two. Co-location encourages daily one-on-one communication, impromptu meetings, over-the-shoulder reviews, and shared access to all project information, which is an essential organizational strategy. Based on the TPZP team's experience, when the designer, constructor, and owner communicate freely, coordination occurs at the lowest levels in a timely and efficient manner.

TPZP has begun the integration of design and construction staffs. Task-force groups were formed early in the proposal process to develop and evaluate alternative technical concept (ATC) proposals, develop an integrated schedule, and complete designs for our construction estimates. We have established working relationships and responsibilities, providing a solid foundation for advancing the project.

Design Standards and Criteria: The initial step in the design process is to assemble the current criteria documents, third-party requirements,

MOUs, and environmental stipulations. The initial task for each package is to assemble all the criteria and requirements for a given package. This will be checked against the master, as part of the validation and verification (V&V) process.

Coordination with the CHSRA: The project's success requires the TPZP team to work closely with the CHSRA's representative. Parsons has developed a successful working relationship with the CHSRA's representative since our initial work on the high-speed train project in 2000. Our success in delivering the preliminary 15 percent plans for the San Jose-to-Merced segment, in coordination with the CHSRA's representative, has allowed us to develop strong working relationships with CHSRA staff and to build an understanding of the requirements of the program. Our strategies for coordinating with the CHSRA staff include developing parallel working relationships between the representative's technical staff and the design teams. This will permit close coordination on technical issues on an ongoing basis.

Coordination with Caltrans and Work by Others: The initial contract will interface with the Caltrans work for the relocation of the SR 99 freeway from Ashlan Avenue to Clinton Avenue. It's likely that the construction of the CAHSR CP1 project will be started before the construction of the Caltrans-designed SR 99 work. In addition, Caltrans has prepared plans for the Fresno Street undercrossing that is adjacent to the new high-speed train underpass. TPZP will integrate the high-speed train design with the Caltrans plan for Fresno Street.

The physical interfaces will be developed in coordination meetings with the Caltrans District 6 design team. Parsons has a long and successful track record of working with District 6 on the ongoing $1.25 billion TRIP/Bakersfield Program Management project. As a result of our work in the district, Parsons has a unique familiarity with its people and approaches, which will facilitate coordination and speed the resolution of issues.

Ground-breaking for the Parsons-designed 7th Standard Road/UPRR Grade Separation in Bakersfield, developed in coordination with Caltrans District 6.

The other main issue is the coordination with future civil, stations, and systems contracts. Parsons has been actively working on the high-speed train project as regional consultant for the San Jose-to-Merced section. Our familiarity with CHSRA criteria and systems design will be important in ensuring that the design standards are understood and carefully followed by the final design team.

World-class High-Speed Train Experience: We also have expertise in high-speed train design on our team, including Parsons' systems engineer Ed Mortlock and the engineering staff with SYSTRA and Korea Rail Network Authority (KRNA). Ed brings 30 years of experience in transit and railroad signaling and train control applications. An electrical engineer, he is a recognized expert in the planning and implementation of advanced-technology train control systems. During the planning for bidding the project, we have engaged SYSTRA and KRNA staff in the development of the embankment design and systems-design features. SYSTRA and KRNA will play a key role in the criteria development, analytical approach for rail/structure interaction analysis, and systems design detailing in the CAHSR CP1 project.

Third-Party Interface: The project's success requires the TPZP team to work closely with a wide variety of stakeholders and third parties, including the following:

- Railroads, including BNSF, the UPRR, and the SJVRR
- Cities of Madera and Fresno
- Transit operators/operations
- Madera and Fresno County departments of public works
- Environmental jurisdictional agencies, such as the U.S. Army Corps of Engineers (USACE), U.S. Fish and Wildlife Service, California Department of Fish and Game (CDFG), California Environmental Protection Agency, California Department of Water Resources, California Land Commission, San Joaquin Valley Air Pollution Control District (SJVAPCD), and California State Water Resources Control Board (SWRCB)
- State and federal agencies, including the California Department of General Services, California Public Utilities Commission, Central Valley Flood Protection Board, U.S. Bureau of Reclamation, U.S. Dept. of Transportation, Federal Railroad Administration, and Cal-OSHA
- Utilities and agencies, such as the Fresno Irrigation District (FID); Madera Irrigation District; Madera Flood Control District; MCI; AT&T; Comcast; Kinder Morgan Petroleum; PG&E; Sprint-Nextel; Level 3, tw telecom, Verizon; and city water, storm, and sanitary sewer systems

We have identified the key interfaces and coordination methods and processes specific to each of the key stakeholders' and third parties' concerns

Benefits of an Integrated Team

Integrating construction into design

- Optimizes design within the specific site constraints and conditions
- Considers various construction methods
- Minimizes installation risk
- Confirms material quantities

Integrating design into construction

- Addresses quality of construction
- Provides for a smooth transition from construction through start-up and commissioning (pump stations)
- Provides timely resolution of design issues
- Provides knowledgeable technical direction during construction

Korea Rail Network Authority

KRNA is a world leader in high-speed rail with proven design and construction capabilities. Most recently, this includes opening the world's fifth high-speed line (Gyeongbu), the electrification of major trunk lines, and the construction of the intercity rail link in the Seoul metropolitan area.

SYSTRA USA

SYSTRA brings world-class high-speed train experience to the TPZP team. SYSTRA USA (SYSTRA) is part of the SYSTRA Group, an international engineering and consulting group of more than 2,500 employees specializing in rail (passenger and freight) and public transportation, which has conducted projects in more than 150 countries and 350 cities since 1957.

and key issues. Following NTP, we will begin coordinating and partnering with these parties by conducting design mobilization workshops, which will introduce the project and the project team and provide a detailed update of the design, design units and packaging, and the schedules for the project's final design and construction to attendees. The intent of this workshop is to help ensure that subsequent design reviews are more efficient and effective for all parties.

The principal subject of these kickoff meetings is to agree upon the criteria and standards required and the specific stipulations included in master agreements developed between the CHSRA and the third parties. This establishes the performance baseline for the work done. The baseline requirements are included as part of the V&V process, as described in Section 5. In addition to task-force meetings, we will hold design workshops and design review meetings to facilitate design discussions between the CHSRA and project stakeholders, including the third-party utilities and UPRR, SJVRR, and BNSF. As design proceeds, we will assess design changes, comments, and requests from the third parties for conformance with the agreed-upon baseline. Significant changes will be raised with the CHSRA's representative for approval before proceeding.

Third-party coordination is described in detail in Section 2. Key elements of this coordination include the following:

- Identifying specific points of contact at each agency, utility, jurisdiction, and entity that may experience an impact on its facilities and activities during construction and for each contract interface.
- Assigning a Utility Coordinator, Wayne Karlik, who reports directly to the Project Manager/Director, Josh Randall, to provide a single point of contact, to resolve utility issues, and to closely track events that could create schedule impacts.
- We have assigned two former senior executives of the UPRR, Michael Ongerth and Gary Luenenborg, to serve as our Railroad Advisors. Both Michael and Gary are Parsons employees and will provide critical insight into the likely concerns of the affected railroads, helping our team to mitigate schedule risks.
- Implementing an environmental compliance plan through our Environmental Compliance Manager, Macie Cleary, to actively track the execution of mitigation requirements during design and construction.
- Scheduling design reviews and review times by affected third parties into master schedules for each design package or unit.
- Developing and implementing a communications plan, through our Public Involvement/Stakeholder Manager, Edgar Gutierrez, to communicate effectively with the local jurisdictions.
- Inviting stakeholders and third-party participants to participate in our weekly task-force meetings, our forum to resolve issues and develop solutions among a multidisciplinary team.

4.2. DESCRIPTION OF ANY DESIGN ADVANCEMENT PROVIDED

TPZP has advanced the design of the project by implementing a 3D model of the guideway and roadway, leading to refined and optimized guideway and road profiles. We have evaluated bridges, viaducts, and walls. In addition, all our design modifications have been coordinated with the construction team to take advantage of competitive strategies for embankment and structure construction.

State-of-the-Art Infrastructure Modeling – Parsons uses state-of-the-art 3D, 4D, and 5D (xD) modeling techniques to develop intelligent models for infrastructure projects that help design teams create optimized solutions. Parsons has developed sophisticated tools to support the xD modeling, including PARBID℠, and it offers its unique expertise, resources, and tools to the benefit of the CHSRA. PARBID℠ allows its users to quickly and efficiently extract quantity information from the xD models, created from concept through final project design. These models are not only generated for full-build conditions, but also for each phase and intermediate phase of the design and construction, including multiple traffic

Parsons has 800 transportation professionals in California. We have more than 50 years of established working relationships within the San Joaquin Valley, delivering permits and approvals, which will ensure the timely progression of the project.

control schemes, preloads, and other incremental design and constructed elements of the work.

Geotechnical Considerations – TPZP, working with AMEC, EMI and SYSTRA, carefully evaluated the geotechnical aspects of the at-grade typical section, including settlement and deflection along the high-speed train guideway. We used SYSTRA's experience with high-speed rail embankments in France, combined with AMEC's local knowledge to develop an at-grade guideway typical section.

4.3. PROJECT-SPECIFIC DESIGN CONSIDERATIONS

Specific attention was given to the complete scope of work for the CAHSR CP1 project, and in some cases alternative technical concepts (ATCs) were developed and have been presented to the CHSRA. Below are a few examples of specific areas:

- Utilities
- Design of the high-speed train embankment and prepared subgrade
- Structures foundations
- San Joaquin River crossing and other long-span structures
- High-speed train tunnel under SR 180
- Trench with pump station
- Future high-speed train integration

4.3.1. Future High-Speed Train System Needs

TPZP has conducted its civil and structural design analysis with due consideration to facilitating a subsequent design-build contract for the California high-speed train (CHST) systems by others. We understand that the CHSRA's intent is to provide as much flexibility as is reasonably practicable while minimizing cost to the future design and construction of the automatic train control, communications, traction power, and overhead contact systems (OCSs). The RFP indicates the requirements to provide mounting provisions for OCS poles, cable ducts that pass through and under earthworks, and structure to provide for cables running from one side of the track to the other. These provisions are in line with the proposed future interlocking control houses and cases, communications shelters, OCS section switch locations, traction power substations, switching stations, and paralleling facilities.

Civil Design for Future CHST Systems

Our team has given due consideration to all future systems needs with respect to the civil design and implementation of the project works. These civil considerations include the following:

- Automatic train control houses and facilities for mounting high-speed train equipment on elevated guideway and at grade. In the short term, a conventional wayside signal system that may support interim operation of Amtrak services.
- Treatment of reinforcing in concrete decks as described in the design manual to minimize electromagnetic interference effects on future track circuits.
- Future track alignment with allowances for the correct height clearances from slab top to the underside of overhead structures.
- Facilitating designs to include additional width to accommodate additional cable trough requirements through crossover and turnout locations.
- Making clearances and facilitating future connectivity between the trackway and adjacent land where future systems facilities will be located, including automatic train control houses, communications shelters, and radio sites (every five miles). Height allowances for radio towers have been examined so they do not interfere with structural elements and adjacent highway bridges. OCS and traction power facilities also require land and access to high voltage sources, which are necessary for the traction power stations.
- Providing space allowances and cable access for pump equipment in the box tunnel section. This short tunnel and cut sections have been given additional consideration for the future mounting of OCS support fixtures and for the possible location of crossovers at the south end, just north of the future station site.
- The length of the service zone must be at least 15 feet by 35 feet to accommodate the longest element to be manipulated. The length of a turnout for 250-mile-per-hour operation is almost 630 feet. Also, adequate road access and turnarounds are recommended to facilitate delivering the crossover elements.

4.3.2. Other Design Considerations

Plan for catenary neutral sections: Rail grades within 2,000 feet of traction power supply points should have a longitudinal slope no more than 0.6 percent (0.6 feet/100 feet). If this is infeasible, a site-specific study will be performed by SYSTRA and KRNA, which have the specialized experience and software necessary to develop workable solutions.

Dynamic interaction effects between rail and viaduct structures: The dynamic effects of high-speed train operation are of significance in considering structure design for structure longevity, maintenance costs, and rider comfort. Our design team includes SYSTRA, which has designed high-speed train structures for design speeds of up to 250 miles per hour.

Among the best practices that we will employ are dynamic checking of the structure and the preparation of a rail/structure interaction report.

Planning for Detection Systems: We will provide capability for external detection systems, including the following:

- Train-specific detection, including hot-box detector, flat-wheel detector, and train-gauge detector
- Environmental detectors, including wind detector, seismic event detection, and flooding formation detector

Crossover Planning: Rail crossovers will be planned according to the operation plan. In general, international experience is that the spacing of crossovers is between 15 and 20 miles. The design needs to consider the areas required for assembly of switches and crossings. Assembly areas can be adjacent to the switch locations or along a siding track near the crossover. In both cases, it is necessary to consider the necessary clearance for the passage of the preassembled elements: overhead piles, electrical devices,

cable ducts, and drainage must be adapted to permit free passage of the largest elements of the switches.

Guideway cross section: We consider that a track center distance of 15.75 feet is adequate for a 250-mile-per-hour design speed, as compared to the 16.5 feet shown in the reference design. This is dependent on the aerodynamics of rolling stock to develop an optimized section. Optimizing the cross section will save millions in earthwork and structure costs. It is important to highlight that being the first contract, our study will provide savings for the whole project. With SYSTRA on our team, we have access to SNCF laboratory, which will provide all the expertise to optimize all aspects of the cross section, based on European and worldwide experience, and on the expertise of SNCF laboratory for the completely new aspects of 250-mile-per-hour speed.

Pedestrian and car access for maintenance: For vehicle access, it is required to provide access every 2.5 miles from a road with parking and maneuvering area at track level. Access will be located on alternate sides of the guideway to provide access to both side of the alignment.

Catenary pole locations: Consideration will be given to shift the catenary pole closer to the track centerline. A closer spacing can reduce the pole costs by reducing the moment arm of the catenary wire. On structures, placing the OCS pole along the track, rather than on the edge of the deck, will also provide saving as again the moment transferred to the deck due to the stress provided by the posts will be less.

Guideway alignment: Finally, the TPZP team has enlisted SYSTRA as our lead for high-speed train design support, including the development of the final detailed rail alignment. We can provide assurance to the CHSRA that the final alignment is completely compatible with 220-mile-per-hour operation, and with the maximum alignment speed design criteria of 250 miles per hour.

4.4. ANTICIPATED DESIGN PACKAGES AND SUBMITTAL DATES

Our design schedule calls for the completion of design in 15 months. Design work and construction will be advanced in separate packages by various design teams. Right-of-way will need to be acquired to allow for demolition of existing facilities and for construction of the new rail system to begin. By packaging our work in multiple project elements, the TPZP team will have the schedule flexibility to keep the project moving forward, should the acquisition process be delayed. We can also divide packages into smaller packages, if needed, to prevent project delays.

Design will begin immediately upon receipt of NTP. The construction of critical items will begin six months after the start of design.

The general schedule of work is shown in Figure 1-1, indicating that design work on all three segments will be advanced in simultaneous packages.

4.5. COORDINATION OF DESIGN AND CONSTRUCTION

Biweekly design coordination meetings were held during the proposal development phase to coordinate the work of the design team and the estimating and construction teams. These meetings provided an opportunity for the designers to make use of the construction team's expertise with foundation construction, bridge construction, retaining wall types, work zones, utility coordination and relocation, and embankment construction. The design team, in turn, provided the estimating and construction team with quantities and the location of quantities required for the project and resolution on design approaches proposed by the construction team.

Specific topics discussed and resolved during the course of the proposal phase included determination of the following:

- ***Subgrade design:*** The selection of our recommended guideway section was developed with close coordination between the design and the construction teams. The design and construction task force for this element considered trade-offs of increased admixtures to the in-situ materials, phasing and stability of the various material layers, and consideration of strategies for long-term stability and durability of the finished surface.
- ***Retaining wall types:*** The selection of wall types and backfill materials was coordinated between the structural design team and the construction team. The use of mechanically stabilized earth (MSE) walls was determined based on flexibility, speed of construction, and lowest combined cost.
- ***Bridge foundation types:*** The selection of foundation type was closely coordinated between the geotechnical engineers, structural engineers, and the construction team. Cast-in-drilled-hole (CIDH) piles were selected based on geotechnical and noise and vibration considerations.
- ***Bridge and viaduct superstructure types, spans, and configurations:*** The viaduct superstructure, a single-box prestressed concrete box girder, follows the configuration required by the CHSRA directive drawings. Our design team, in close coordination with the construction team, worked to optimize this configuration to develop a standard section applicable to multiple span lengths. The benefits of this typical section include a reduction in construction costs and a consistent look for the viaducts, per the requirements of the CHSRA aesthetic guidelines. Main span structures were designed for steel and concrete options, thus providing a wider range of options to the CHSRA, and the City of Fresno in the selection of major structures.
- ***Abutment locations:*** Consideration was given to the relative cost of open and closed abutments. The construction team was able to provide valuable input to the designers as to the relative cost of added bridge length versus shorter bridges with an abutment supported on piles with an MSE-wall-retained embankment.
- ***Trench section walls, waterproofing, and base slab details:*** A secant pile trench was selected for the design of the Fresno grade separation. This trench type provides many benefits, including expeditious construction and reduction in noise and vibration impacts. No waterproofing is expected to be required for this trench, based on geotechnical data indicating a water table well below the base of the trench invert slab. A U-wall design was initially selected for the Jensen

Trench, due to its shallow depth; however, after design development our ATC may delete the Jensen Trench.

- ***Jacked box versus sequential excavation method (SEM)-mined tunneling for the high-speed train tunnel under SR 180:*** Alternative strategies for construction of the tunnel were developed jointly with the design and construction teams. The construction team was particularly helpful in assessing the relative risk of alternative approaches. The jacked box method was chosen as the most economical option.
- ***Selection of overpasses versus underpasses for roads crossing the high-speed train alignment:*** The relative cost of underpasses versus overpasses was made by the construction team, based on designs prepared by the design team.
- ***Rail profile, including the alignment of the tracks at Jensen Avenue to eliminate the Jensen Trench:*** The pricing of the trench versus the added cost of a replacement structure at Jensen was critical in evaluating our ATC for the Jensen Trench.

4.6. AESTHETIC SOLUTIONS FOR NON-STATION STRUCTURES

This initial segment of the high-speed train project presents an opportunity to shape public opinion about the project. Strategies used for the most visible parts of the project give assurance that commitments made by the CHSRA are kept. The TPZP team shares the CHSRA's goal to create a system with a consistent statewide image, yet remain flexible enough to incorporate the local context.

The TPZP team has provided a design that accomplishes the overall project goals, including the following City of Fresno objectives:

- Provides aerial structure designs that are consistent, elegant, simple, and timeless
- Provides grade separations that are specific to the physical context along the alignment
- Meets the goals of the City of Fresno by contributing to the build-out of the City of Fresno 2030 General Plan
- Meets the required goals of the City of Fresno design guidelines, combined with an outreach method to allow the City to suggest enhancements
- Minimizes infrastructure by optimizing designs, thus reducing visual impact of high-speed train structures
- Provides a technically and economically feasible design that meets engineering, operations, and funding constraints.

The TPZP aesthetics work will be led by Roland Genick, AIA. He has more than 18 years of experience involving the design and development of a wide range of projects. His extensive experience as design manager and architect of record in large transportation projects includes the Metro Gold Line Foothill Extension and Mid-City Exposition Light Rail Transit design-build projects in California, the Denver International Airport South Terminal Redevelopment Program, and the Commuter Rail Extension to Monterey County. Roland is the recipient of multiple awards, including the AIA California Council Award for Urban Design for the Mid-City Exposition Light Rail Transit project.

Roland's experience as an urban designer in the Southern California Association of Governments Compass Blueprint Implementation Program uniquely qualifies him to lead the coordination between the CHSRA, stakeholders, and the design-build team in the implementation of the aesthetic design for the CAHSR CP1 project.

4.6.1. Context-Sensitive Design

One obvious place the CHSRA's commitments are seen is at the local road crossings. These local crossings will be a legacy to the cities and counties, incorporating design features that can enhance mobility and access. From a community standpoint, the integration of a major transportation project into the community, combined with its aesthetics and design, are two important measurements of the success of the project. After all, the corridor will be part of the community for generations; therefore, the design, including aesthetics, becomes critical to the integration of the project within the community it is serving.

Parsons designed the Shaw/Marks Grade Separation in Fresno, which was awarded the Caltrans 2004 Excellence in Transportation Major Structures Award

TPZP proposes a collaborative approach to the design and placement of aesthetics elements within the corridor. A key effort in achieving our project approach will be working in coordination with the CHSRA through routine workshops during the design process. Design guidelines, such as the CHSRA's aesthetic guidelines for non-station structures and the City of Fresno's design guidelines for the high-speed train project, and other supporting documents provided to us will be used to help guide our designs and ensure that we are following the design intent for the project corridor.

Our commitment to a collaborative design environment also extends to stakeholders' input through the context-sensitive solutions (CSS) process. For the I-25 T-REX design-build project in Denver, Parsons employed a set of urban design guidelines to develop context-sensitive solutions to the project elements. The guidelines, while not fully developed, provided the direction for our design team; similar to the high-speed train guidelines developed by the City of Fresno. See Aesthetics Exhibit 1 for further details.

The CSS process also creates a vehicle for the public, through their local stakeholders, to influence the design of the project. This participation ensures that the project is in harmony with the community; reflects community values; and is sensitive to and preserves the environmental, scenic, aesthetic, historic, and natural resource values of the area. TPZP is committed to this process because our experience has shown that bringing the public into the process early leads to early public acceptance and buy-in.

Typically, we adjust our designs with municipal agencies, businesses, and community stakeholders to incorporate concepts and/or elements that bring context to the project. For these stakeholders, we will establish and schedule clear consultation points to allow them to see and influence the designs as they develop. This will be accomplished through the interface coordination and design workshop process outlined in the RFP.

TPZP's Aesthetic Bridge Design
CHST over Tulare Street in Fresno

4.6.2. High-Speed Train Infrastructure

For the high-speed train, main infrastructure elements consist of high-speed train bridges, overpasses, aerial structures, and retaining walls.

High-Speed Train Bridges and Overpasses

The TPZP team proposes to approach the aesthetics of the bridges and overpasses by separating the structures by location: within the metropolitan area of Fresno, which address the City's design guidelines for the project, and those structures that are within more rural areas of the corridor. In both instances, similar forms and characteristics will be combined to allow for a cohesive design to the overall corridor while allowing for context-sensitive applications of aesthetics appropriate for each location.

An example of our aesthetic approach to the design of the bridges can be seen in Aesthetics Exhibit 2.

Walls: Proposed retaining walls within the project corridor will be mechanically stabilized earth walls, which will have a vertical fractured fin texture. The use of this texture will help to deter graffiti on walls in the corridor and will comply with the requirements of the City of Fresno in its urban design guidelines. Aesthetics Exhibit 2 illustrates our design approach for retaining walls at Tulare Street.

Columns: Creating a family of columns that have many of the same forms but can address different applications necessary in the corridor allows us to design our structures efficiently while maintaining a degree of consistency throughout the corridor.

TPZP proposes using simple, aerodynamic forms without texture. It is important to remember that columns are primarily seen by drivers crossing under the bridge and are therefore seen briefly as the driver approaches the bridge, rather than for a long period of time, like a wall that runs for a distance within the corridor. The use of radius forms on the structures will soften their look and create the more aerodynamic appearance required in Fresno's design guidelines.

Parapets: Where auto and pedestrian traffic is brought over the rail line, parapets may be a required element for fall protection. Where parapets are required, we will use them to visually extend the bridge to help visually lengthen the span and thereby lighten the bridge appearance. In the downtown underpass structures, where the train is on a bridge, fall protection will be provided by fencing, as indicated in the aesthetic guidelines. In other instances, these parapets will be used to accommodate future sound walls.

Aerial Structures

The design of the viaducts will center on the main feature crossed (e.g., the San Joaquin River) to emphasize the crossing, with subsequent spans extending from this point, as required in the CHSRA aesthetic guidelines. Examples of our aesthetic approach to aerial structure design can be seen in Aesthetics Exhibits 3a through 8a. Additional aesthetic elements of our proposed viaduct design include the following:

- Consistent elements throughout the City of Fresno, complying with the City's required design guidelines.
- A modern, aerodynamic design aesthetic, as requested in the City's design guidelines.
- Integrated design elements.
- Straddle bents are minimized by the use of mid- and long-span bridge structures. At the UPRR crossings at the San Joaquin River, we utilized radius forms to soften the appearance of the structure.

Retaining Walls

Texture is one of the most important considerations when addressing wall aesthetics. Texture can help deter graffiti while enhancing the appearance of the wall: the rougher the texture, the better the graffiti deterrent. Unless wall size and location dictate otherwise, it is best to use aesthetics on retaining walls that support the design aesthetic rather than create a focal point of the wall. This allows the wall to support the corridor aesthetic while leaving the focus on high visual targets, such as bridges and stations.

Aesthetics Exhibit 2 shows an image of a fractured fin texture on the retaining wall surfaces. This texture provides a rough graffiti deterrent to the wall and creates shadow patterns that will change the walls' appearance over the course of the year and day depending on the quality of the light.

Our team's primary bridge design uses wrap-around MSE walls in front of the abutment and for the wing walls. In essence, these appear as retaining walls and are therefore similarly treated. It is our intent to reduce and eliminate slope paving to the greatest extent possible to minimize maintenance and security concerns.

Additional Design Elements

Fencing and Railings: As required in Fresno's design guidelines for the project, TPZP proposes tubular/picket style fence for critical viewsheds within the City of Fresno. The design of these uses a classic, clean, and simple design for this element. In other areas, such as along rural stretches of the corridor and within noncritical view areas of the City of Fresno, chain-

link fencing will be used for the corridor. When along a pedestrian or bike way, the chain link will have a black vinyl coating.

Local Street Lighting: Per the scope of work, lighting for local streets will follow the requirements of the local agencies.

Train Crash Barriers: TPZP proposes to use the same fractured fin texture as proposed in the retaining wall application on both sides of the crash wall to discourage graffiti.

4.7. AESTHETIC AND STRUCTURAL DESIGN SOLUTIONS FOR KEY LOCATIONS

The CHSRA has requested alternatives to three locations of high importance to the local community: The San Joaquin River Bridge and UPRR structural spans, the overcrossing at Golden State Boulevard in downtown Fresno, and the spans over South Cedar Avenue and SR 99. Designs for these key locations will satisfy engineering standards and technical requirements, be cost-effective, and conform to the aesthetic design guidance provided by the CHSRA, the City of Fresno, and the aesthetic mitigation measures in the final environmental impact report/environmental impact statement (EIR/EIS) and the mitigation monitoring reporting plan. TPZP has met these requirements by providing two high-quality aesthetic and structural design solutions at each of these locations.

4.7.1. San Joaquin River Bridge and UPRR Structural Spans

For travelers on SR 99 the San Joaquin River Bridge (Viaduct 203) will become the northern gateway for metropolitan Fresno. It extends from station 2699+48 to 1767+28, with a main span of 320 feet over the river. Our design is compatible with the intent of the San Joaquin River Restoration Program and the habitat needs of the Central Valley steelhead and the Central Valley spring-run chinook salmon; it also minimizes impacts to UPRR operations. This is accomplished by the use of a long-span structure with a reduced foundation footprint at the San Joaquin River crossing and the use of superstructure elements over the UPRR, which are easily erectable, maintainable, and replaceable, thus reducing impacts to UPRR's operations. The spans over the UPRR are the controlling feature for the high-speed train profile alignment for this viaduct, and providing a design with

Our baseline design fits in with the industrial nature of the neighborhood and incorporates an aesthetic that reflect the iconic Fulton Corridor sign.

reduced structural depth was a primary goal of our design. In addition, we reduced the impacts of the straddle bents or outriggers by providing a layout that reduces the number of straddle bents over what was proposed in the RFP's reference plans. The proposed designs accomplish the goals of the CHSRA and allows a more expeditious review and approval by third-party agencies. Some of the agencies reviewing the design for the spans over the San Joaquin River include the following:

- United States Army Corps of Engineers (USACE)
- United States Fish and Wildlife Service (USFWS)
- National Marine Fisheries Service (NMFS)
- Central Valley Flood Protection Board (CVFPB)
- California Department of Fish and Game (CDFG)

Our designs for the spans over the San Joaquin River comply with the City of Fresno's requirement that its major structures enhance the approaches to the city.

Baseline Option

Our baseline design, shown in Aesthetics Exhibits 3a-3d for the spans over the San Joaquin River consists of cast-in-place/prestressed concrete boxes using the balance cantilever method of construction. The continuity of structure type provides an aesthetically pleasing structure that satisfies the requirements of this large river crossing. Construction of the superstructure is done from above, thus eliminating any impacts to the river during construction once the foundation work is completed. This concrete structure maintains the benefits of the standard 120-foot span by providing

Viaduct 203 - San Joaquin River Crossing Baseline Option

Viaduct 203 - San Joaquin River Crossing Superior Option

Golden State Boulevard Crossing Baseline Option

Golden State Boulevard Crossing Superior Option

continuity in the configuration of the system (ductbanks, walkways, OCS support structure) and reduced life-cycle costs.

Our design for the spans over the UPRR utilizes straddle bents or outriggers to span the UPRR right-of-way and a superstructure consisting of a cast-in-place concrete slab over steel plate girders. The steel girders' reduced weight allow for a 20 percent reduction in straddle bent depth and column size, thus reducing the visual impact of the crossing, with the added benefit of a reduced high-speed train profile alignment. Our proposed design for straddle bents includes rounded columns, in keeping with our family-of-columns approach, with curved ends to the crossbeams that are sympathetic to the column form.

Superior Option

The superior design option, depicted in Aesthetics Exhibits 4a-4f, consists of a steel tied arch structure spanning the San Joaquin River. The structure cross-sectional width is reduced from that shown in directive drawings, per the RFP. Support of the OCS elements is provided by a mounting bracket attached to truss members. The reduced section results in a lighter, elegant, and more cost-effective structure.

Straddle bents (or outriggers) span over the UPRR right-of-way with a superstructure consisting of a cast-in-place concrete slab over steel box girders as shown in the RFP. We have optimized the RFP design and reduced the superstructure depth, straddle bent depth, and column size. This optimization further reduces the visual impact of the crossing with the added benefit of a reduced high-speed train profile alignment.

4.7.2. Overpass at Golden State Boulevard

The high-speed train structure spanning Golden State Boulevard, as shown in the RFP plans, is part of the Fresno Viaduct and is located from Station 11152+22 to Station 11155+37 along the S line of the proposed alignment. The structure is located just south of the East Jensen Avenue Bypass, east of SR 99 and west of the UPRR railroad yard in the City of Fresno.

Baseline Option

Our baseline design, shown in Aesthetics Exhibits 5a-5c, consists of steel through truss with a span length of 315 feet. The structure cross-sectional width is reduced from that shown in directive drawings, per the RFP. Support of the OCS elements is provided by a mounting bracket attached to truss members. The reduced section results in a lighter, more cost-effective structure that reduces visual impacts and allows for a reduction in the high-speed train alignment profile. We have optimized the RFP design by reducing the number and complexity of connections, thus simplifying erection and reducing life-cycle costs.

Superior Option

The design for this option, shown in Aesthetics Exhibits 6a-6c, consists of a steel tied arch structure spanning Golden State Boulevard with a span of 315 feet. Support of the OCS elements is provided by a mounting bracket attached to truss members. The reduced section results in a lighter, more cost-effective structure that reduces visual impacts and allows for a reduction in the high-speed train alignment profile.

4.7.3. South Cedar Avenue and SR 99 (SR 99) Spans

The high-speed train structures spanning over South Cedar Avenue and SR 99 are a part of the Fresno Viaduct and are located between Station 11191+47 and Station 11199+97 along the S line of the proposed alignment. The structures are located just south of E. North Avenue and west of S. Golden State Boulevard in the City of Fresno.

Baseline Option

Our baseline design, shown in Aesthetics Exhibits 7a-7c, consists of three steel through trusses with span lengths of 355, 250, and 245 feet. The structure cross-sectional width is reduced from that shown in directive drawings, per the RFP. Support of the OCS elements is provided by a mounting bracket attached to truss members. The reduced section results in a lighter, more cost-effective structure that reduces visual impacts and allows for a reduction in the high-speed train alignment profile. We have optimized the RFP design by reducing the number and complexity of connections and by standardizing spans, thus simplifying erection and reducing life-cycle costs.

Superior Option

Our superior option, shown in Aesthetics Exhibits 8a-8c, consists of three steel tied arch structures with span lengths of 355, 250, and 245 feet. The structure cross sectional width is reduced from that shown in directive drawings, per the RFP. Support of the OCS elements is provided by a

Fresno Viaduct (Cedar Avenue/SR 99) Baseline Option

Fresno Viaduct (Cedar Avenue/SR 99) Superior Option

mounting bracket attached to truss members. The reduced section results in a lighter, more cost-effective structure that reduces visual impacts and allows for a reduction in the high-speed train alignment profile.

This structure will represent the southern gateway to Fresno, tying in with the northern gateway at the San Joaquin River.

4.8. APPROVED ALTERNATIVE TECHNICAL CONCEPTS

TPZP recognizes the detailed efforts by CHSRA and its consultants to advance the high-speed train design to date from Madera to Fresno. In our due diligence to investigate means to improve on that design, our team submitted 12 ATCs, which were reviewed by the CHSRA and various third parties that are directly affected by the project. Of these 12 ATCs, the CHSRA conditionally approved two ATCs on September 21, 2012; however, we were not able to meet the conditions placed on one ATC. Those conditions required that we address future widening of SR 99 with Caltrans and the widening of Cedar Avenue with Fresno. There was not adequate time left to obtain these approvals from Caltrans and Fresno. Therefore, our proposal includes one alternative concept developed to optimize the design, reduce cost, and reduce construction time. A summary description of our approved ATC as presented to the CHSRA along with benefits, all subject to design development, is provided in the Approved ATC Exhibits 1 through 3.

Description of ATC 21.1

This ATC proposes to eliminate the high-speed train trench in the vicinity of Jensen and Church Avenues by designing the Jensen and Church Avenue bridges higher and utilizing steeper grades. The baseline profile indicates that the high-speed train profile is lowered below existing grade in this area to permit the high-speed train to pass beneath the existing Jensen Avenue overcrossing with the required 24-foot vertical clearance over top of rail. Lowering the profile requires the construction of a U-wall structure to accommodate the lowered high-speed train profile. The high-speed train overcrossing will also need to be relocated by approximately 1,000 linear feet.

This area is in a floodplain, necessitating raising the top of wall elevation to reduce the risk of flooding. A pump station is required to remove stormwater runoff from the U-wall section. The trench in the reference design is about 7,000 feet long, with top of wall about 5.5 feet above top of rail at maximum.

Benefits of ATC 21.1

The proposed ATC 21.1 to eliminate the trench provides several significant benefits to the high-speed train. Specific benefits are as follows:

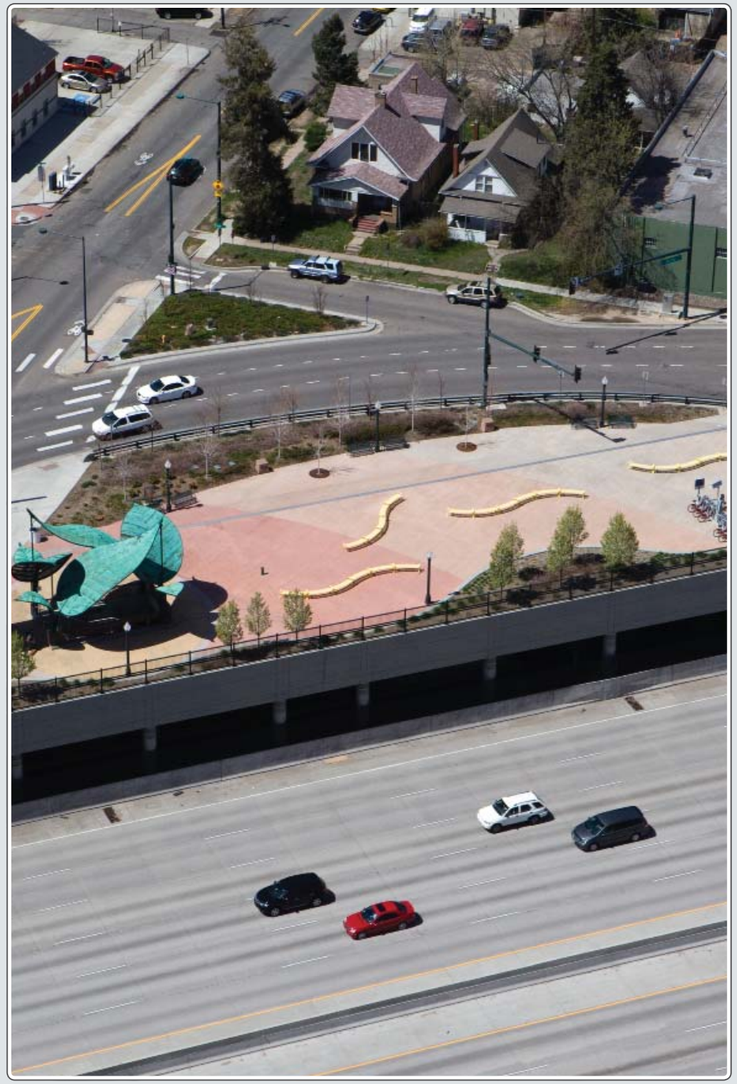
- The proposed ATC eliminates 7,000 feet of trench section, with a significant savings included in our price proposal.
- This sustainable solution reduces long-term maintenance of drainage facilities, including a pump station, and reduces environmental impacts.
- By raising the profile and eliminating the trench, the high-speed train has reduced risk of flooding.
- Eliminating the trench eliminates the need to excavate for trench construction.
- This reduces exposure and costs associated with potential hazardous materials in the excavation.

Design development will be performed to ensure that the three conditions placed on this ATC will be met by TPZP:

- The bottom of subballast shall be two feet (minimum) above 100-year flood elevation per design criteria.
- Demonstrate maintenance of traffic on Jensen Bypass, as the roadway will remain open to traffic at all times, and provide proper clearances for Jensen Avenue Bypass. This roadway is designated as Extra Legal Load Network (ELLN) by Caltrans
- Meet City of Fresno requirements for maximum grades and other roadway standards; meet City's design speeds for Jensen Avenue and Church Avenue.

Aesthetic Enhancements on Parsons' I-25 T-REX Design-Build Project, Denver, Colorado

The T-Rex project included the design and construction of 17 miles of highway and 19 miles of light rail in the busy Interstate 25 corridor through Denver, Colorado. The section shown above was dubbed the "Narrows," where Parsons' team of landscape architects and urban designers, worked with both the Colorado Department of Transportation (CDOT) and the Regional Transportation District (RTD) to ensure that the urban design elements on bridges, such as railings and pilasters, cross street names, decorative buttons, and other elements, were incorporated into the design. Retaining and sound walls on the project included six unique patterns developed by a team of artists and incorporated into the wall designs by the Parsons team.



Within the project's Narrows section, the Louisiana Lid, shown above, stands out as an important node within the community. The lid forms the entry plaza to the Louisiana Light Rail Station; trains are accessed below via either stairs or elevator. Because of its importance in the community, the entry plaza included separately funded artwork, which included the leaf structure over the stair entranceway, benches, and plaza paving. Parsons worked with the artist to incorporate the art pieces into the design of the plaza and oversaw the installation.

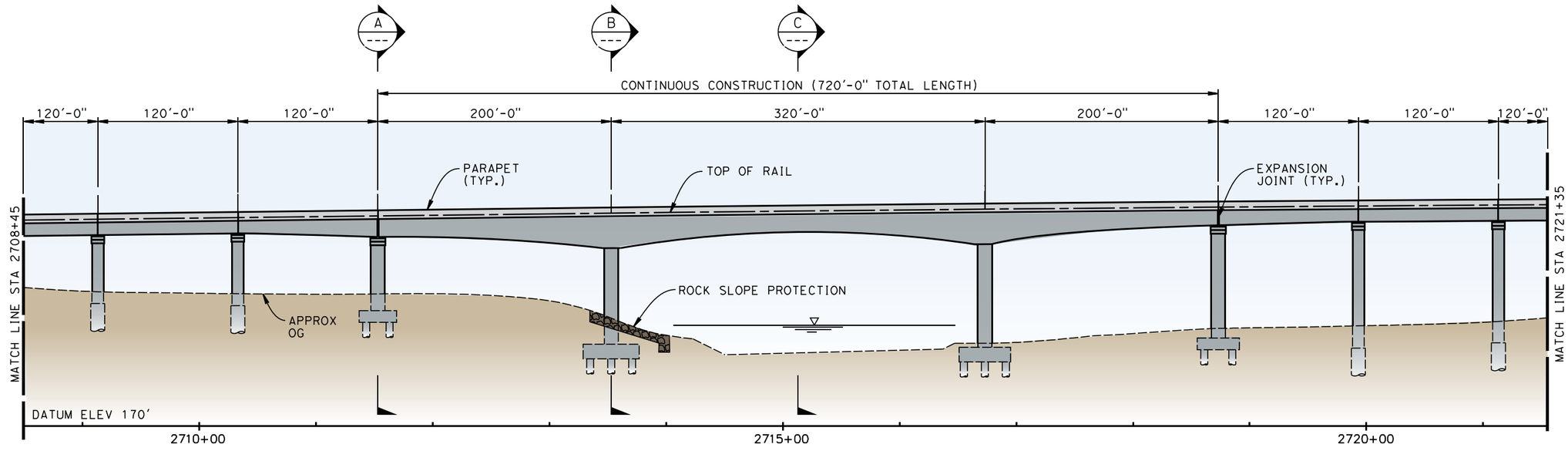
For the design of bridges within the Narrows section of the T-Rex project, Parsons' landscape architects and urban designers used context-sensitive design solutions (CSS) to ensure that the final constructed designs, such as the Emerson Street Bridge seen above, integrated with the community being served. Because of the era of development for this part of Denver, elements from the City Beautiful movement of the early 1900s were used on railings and monuments. Parsons is well versed in the cost-effective application of CSS principles to benefit projects.

The Tulare Street Undercrossing showing a typical bridge and retaining wall design with a fractured fin texture on the walls. A tubular steel fence is used on the bridge and as a railing above the MSE walls.

Viaduct 203 - San Joaquin River Crossing and UPRR Spans Baseline Option

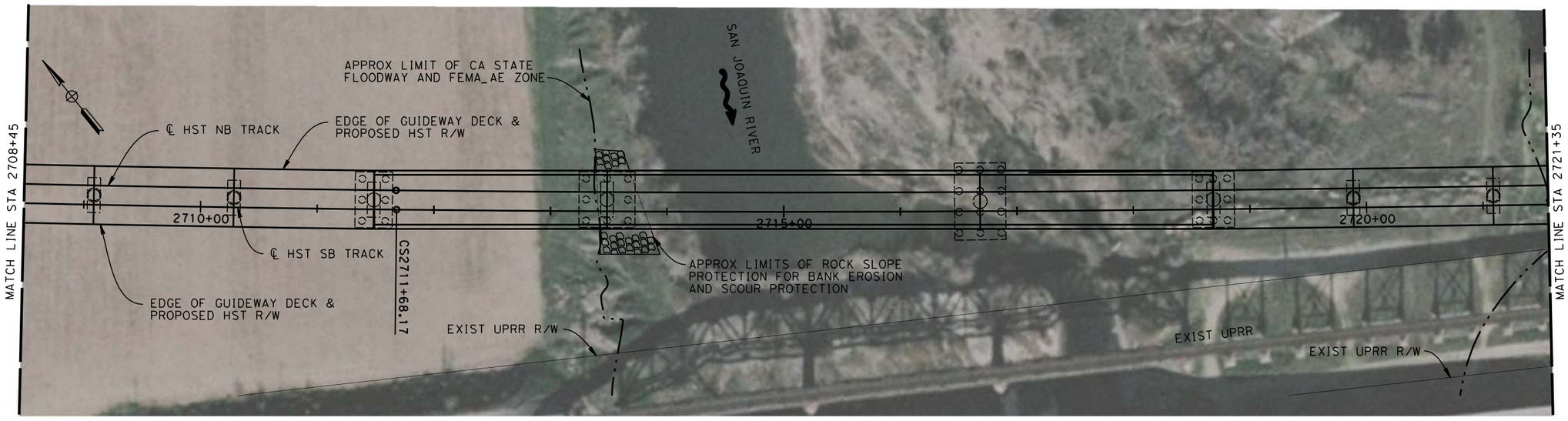
Viaduct 203 - San Joaquin River Crossing Baseline Option

Viaduct 203 (San Joaquin River Crossing) - Baseline Option Plan and Elevation



DEVELOPED ELEVATION

1" = 50'



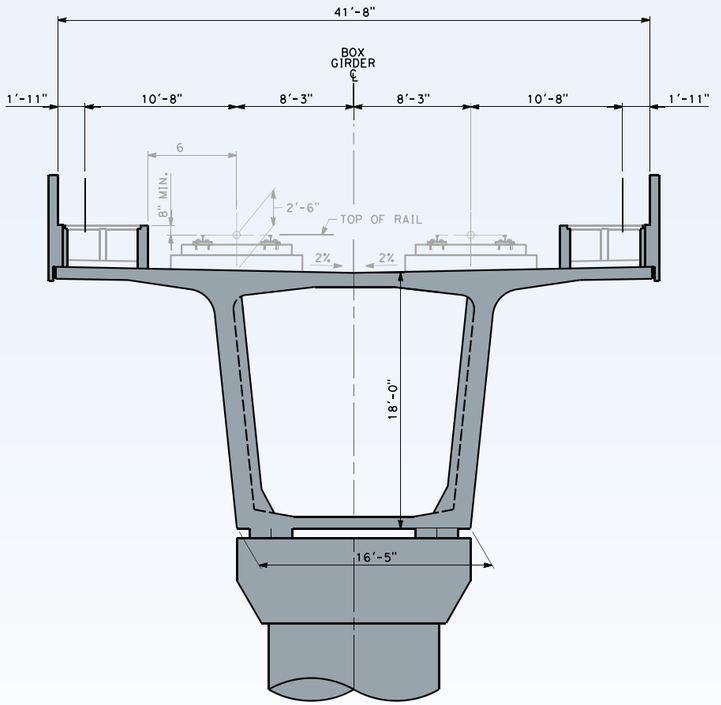
PLAN

1" = 50'

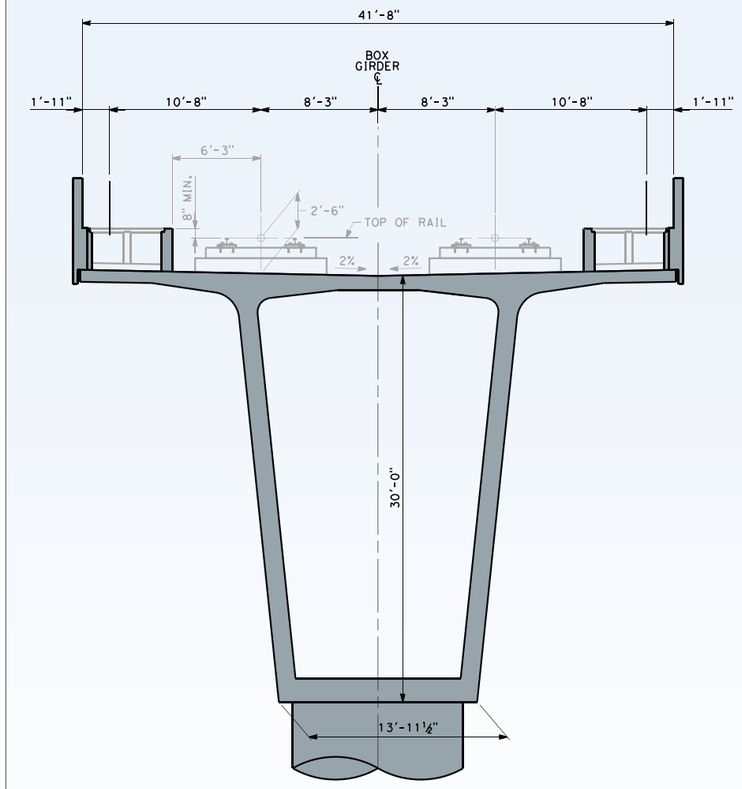
50 0 50

1"=50'

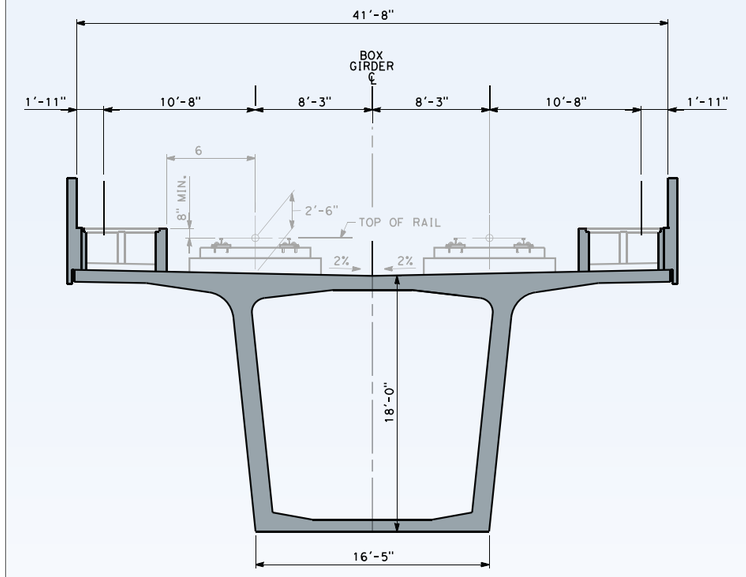
Viaduct 203 (San Joaquin River Crossing) - Baseline Option Typical Sections



SECTION A-A
3/16" = 1'-0"



SECTION B-B
3/16" = 1'-0"

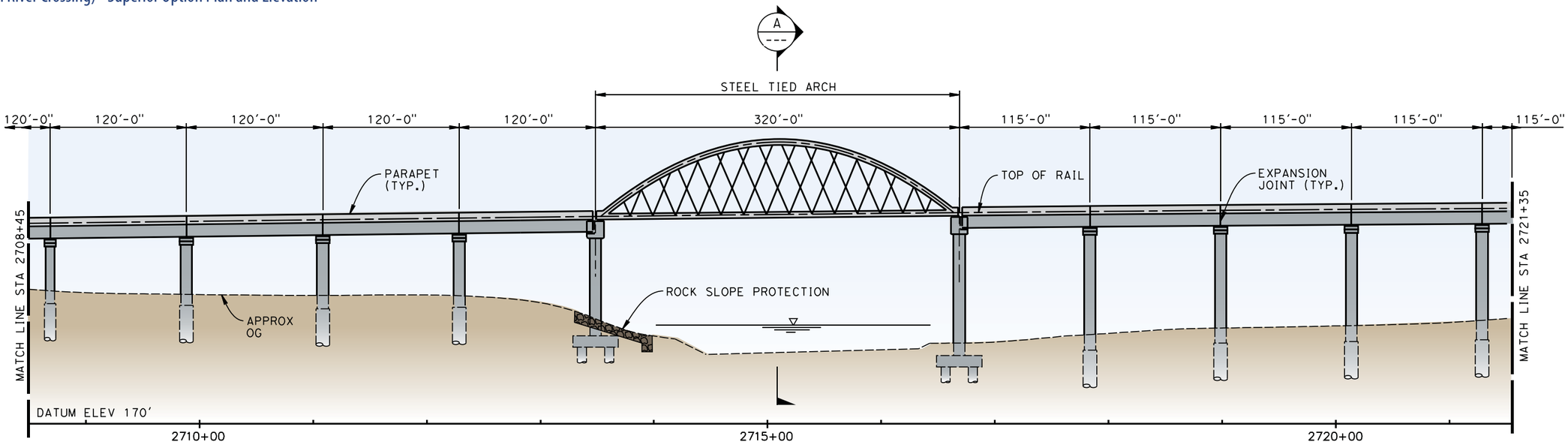


SECTION C-C
3/16" = 1'-0"

Viaduct 203 - San Joaquin River Crossing and UPRR Spans Superior Option

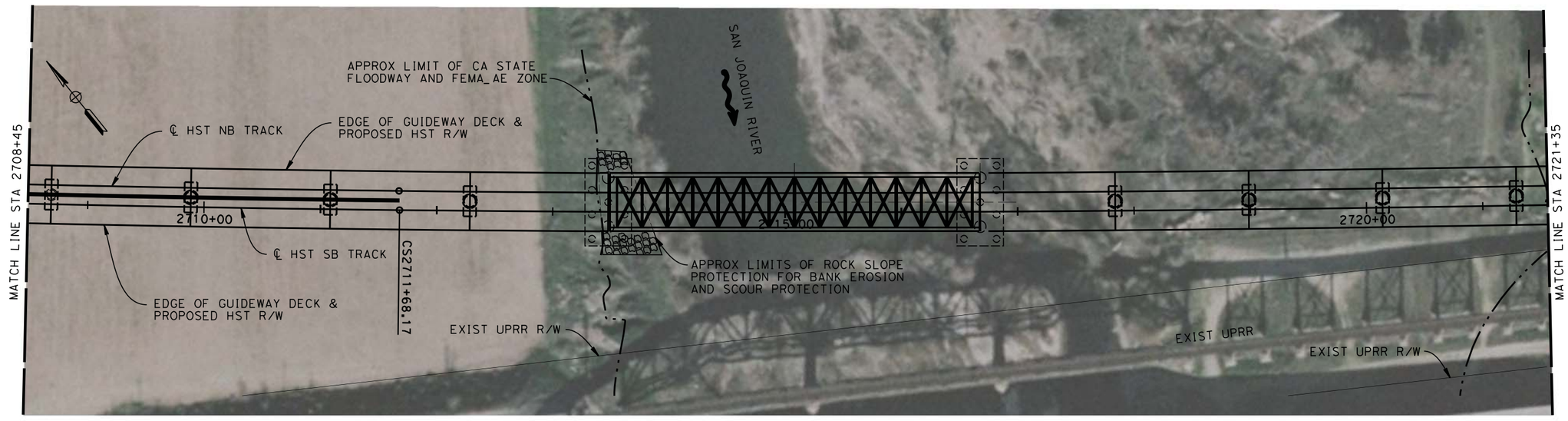
Viaduct 203 - San Joaquin River Crossing Superior Option

Viaduct 203 (San Joaquin River Crossing) - Superior Option Plan and Elevation



DEVELOPED ELEVATION

1" = 50'

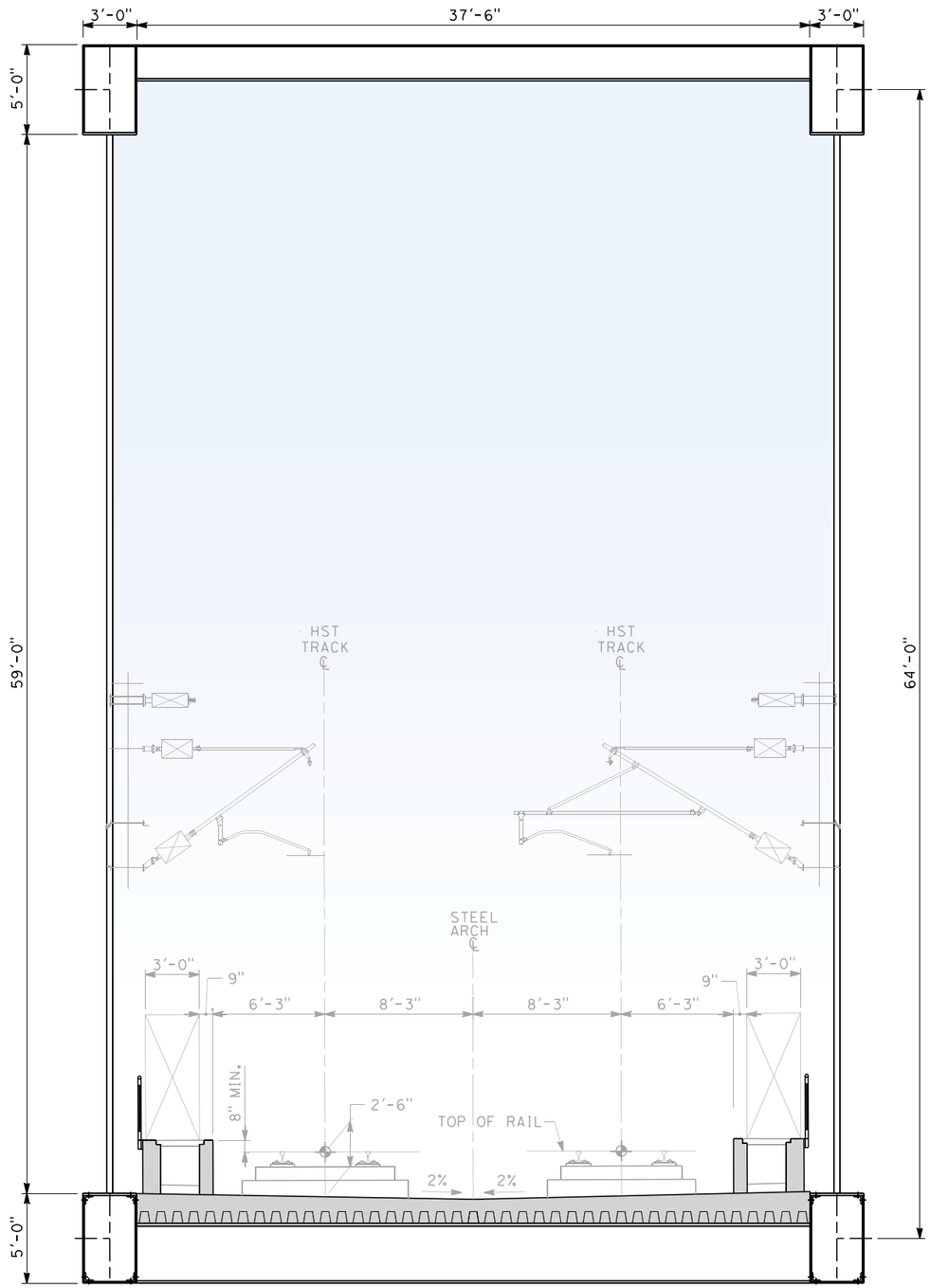


PLAN

1" = 50'

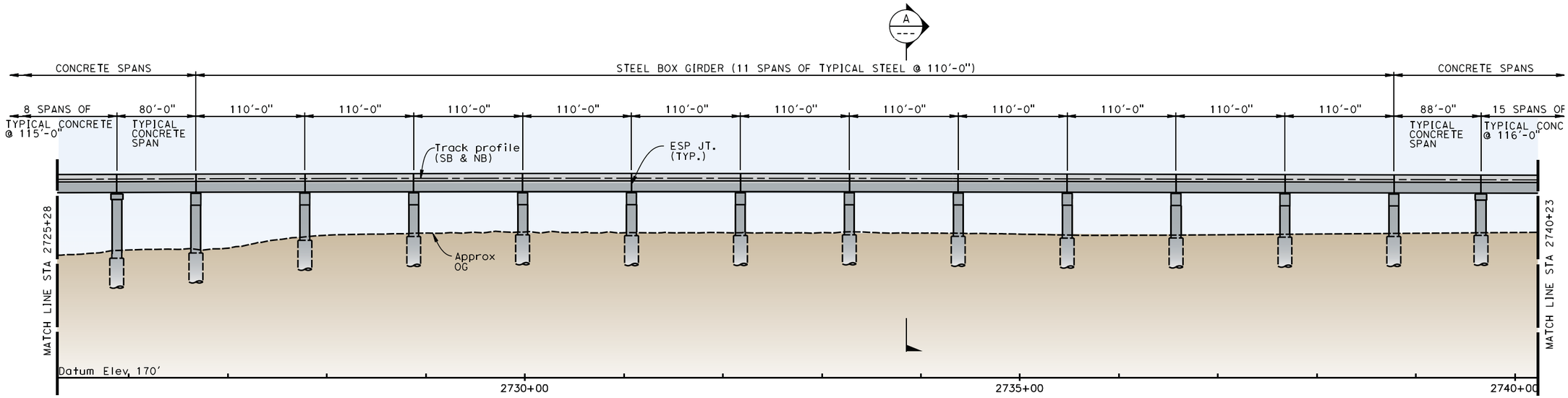
50 0
1"=50'

Viaduct 203 (San Joaquin River Crossing) - Superior Option Typical Section

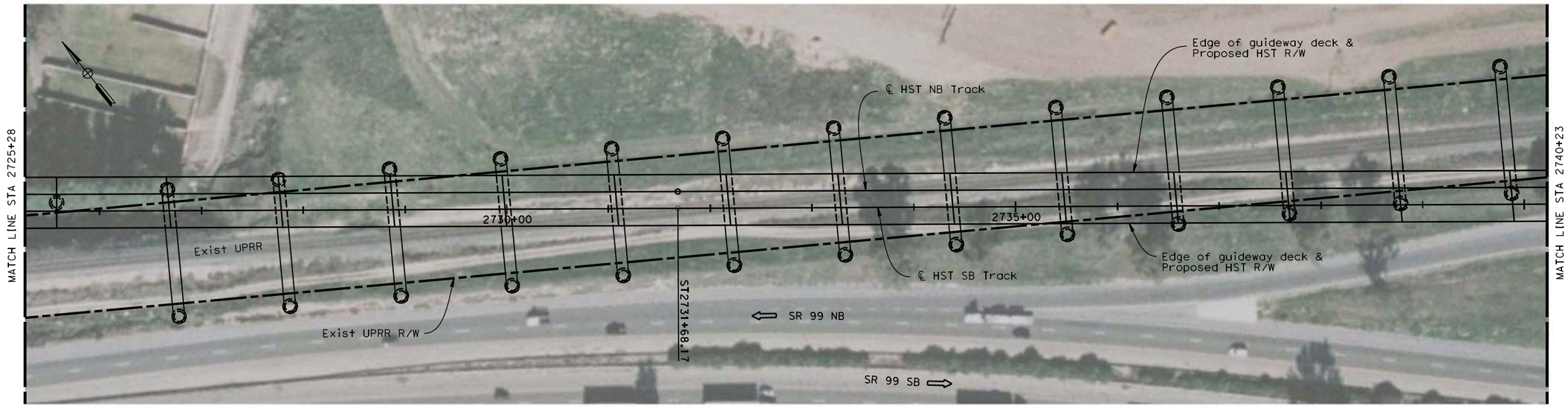


SECTION A-A
1/4" = 1'-0"

Viaduct 203 (UPRR Crossing South of San Joaquin River) - Superior Option Plan and Elevation

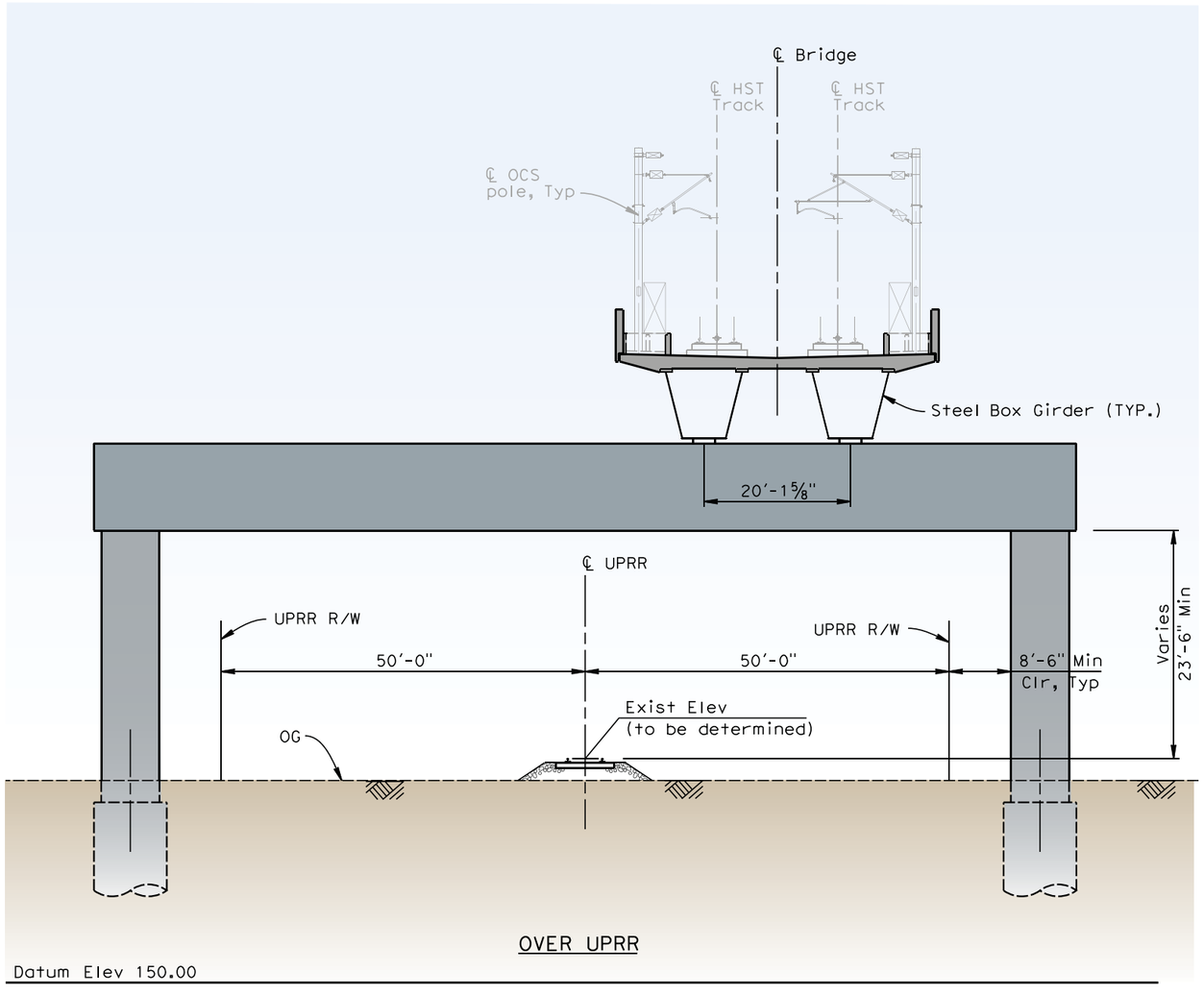


DEVELOPED ELEVATION
1" = 50'



PLAN
1" = 50'

Viaduct 203 (UPRR Crossing South of San Joaquin River) - Superior Option Typical Section

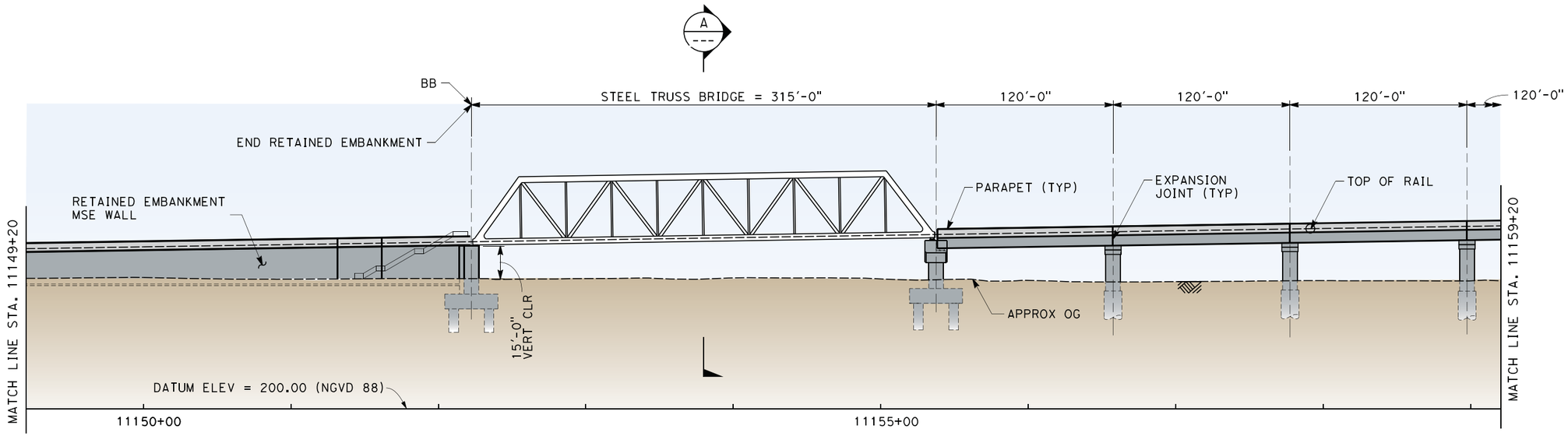


SECTION A-A

3/32" = 1'-0"

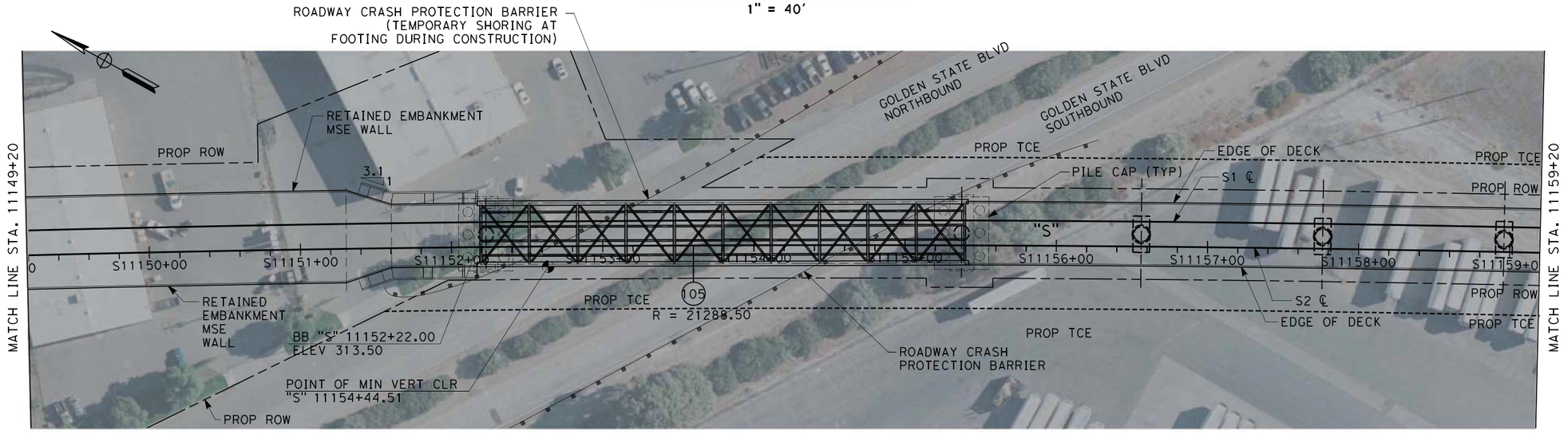
Fresno Viaduct Baseline Option - Aerial structure over Golden State Boulevard with steel truss structure

Fresno Viaduct (Golden State Boulevard) - Baseline Option Plan and Elevation



DEVELOPED ELEVATION

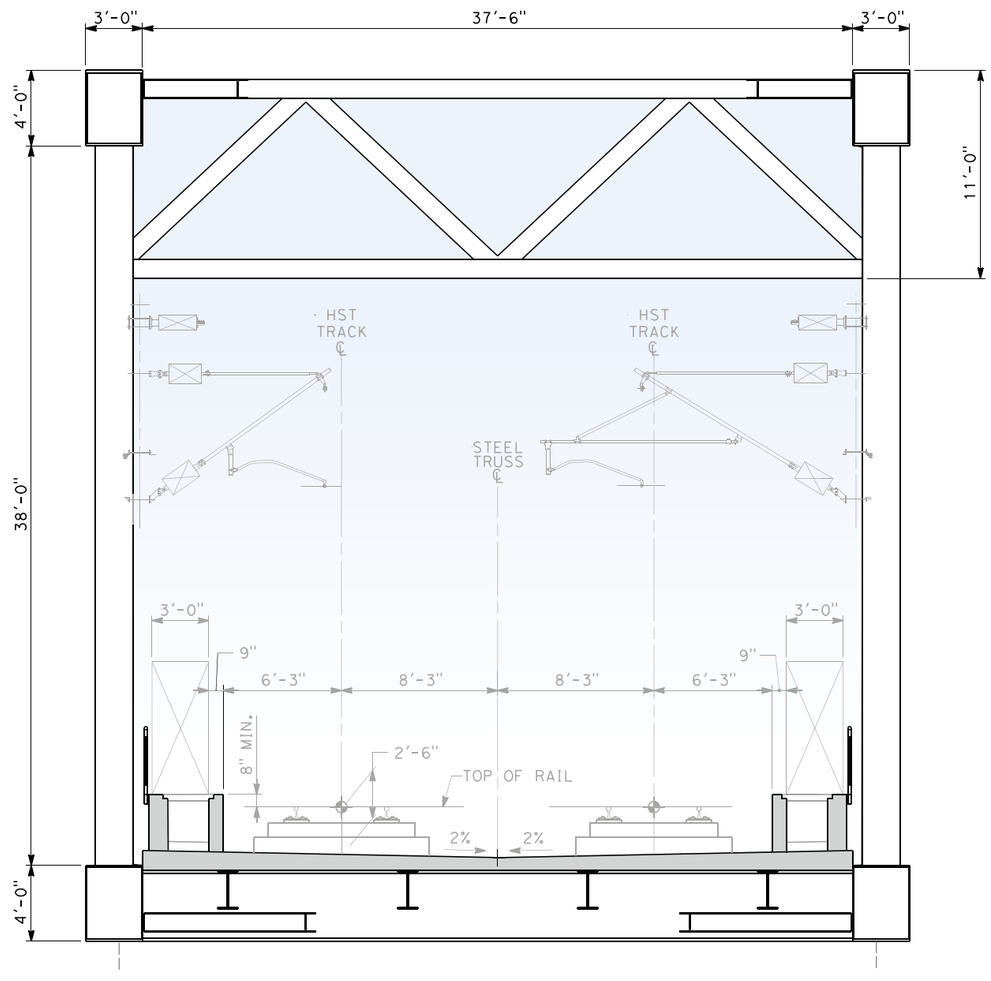
1" = 40'



PLAN

1" = 40'

Fresno Viaduct (Golden State Boulevard) - Baseline Option Typical Section

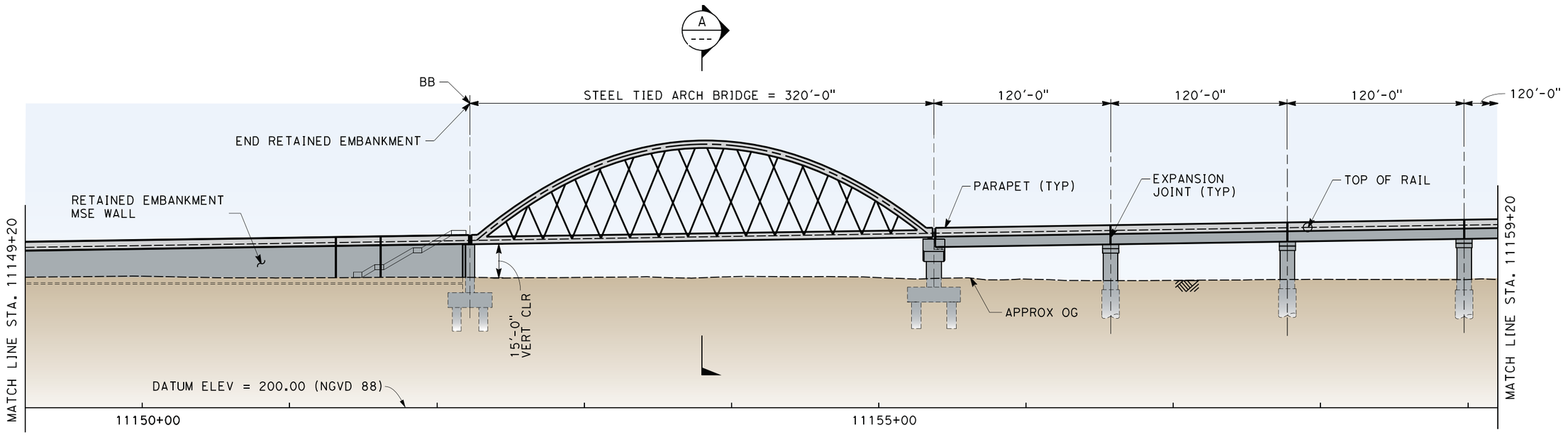


SECTION A-A

1/4" = 1'-0"

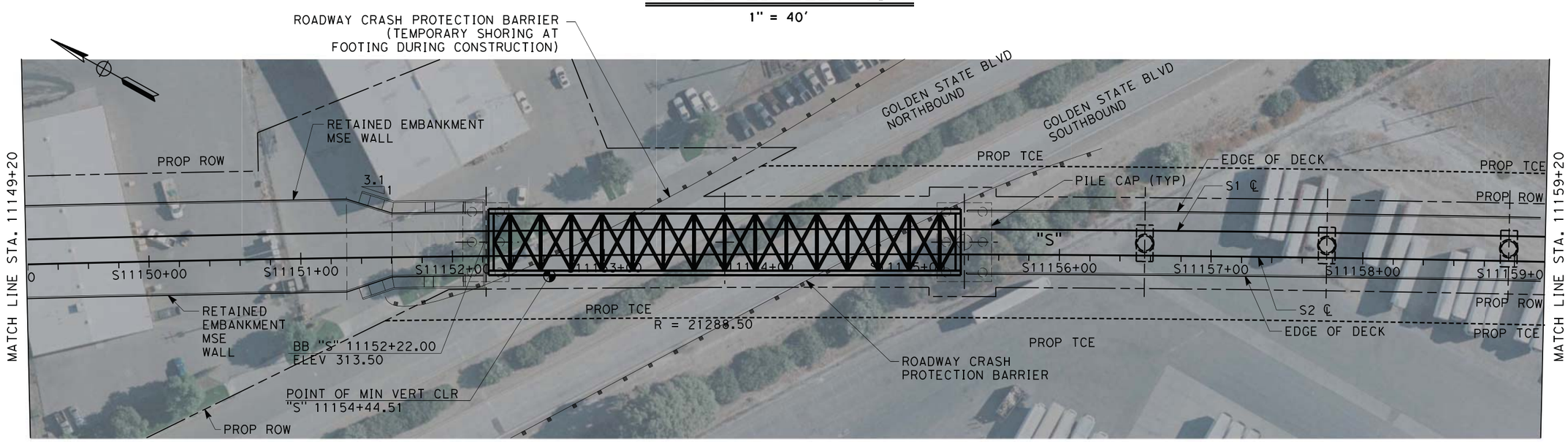
Fresno Viaduct Superior Option - Aerial structure over Golden State Boulevard with steel tied arch structure

Fresno Viaduct (Golden State Boulevard)-Superior Option Plan and Elevation



DEVELOPED ELEVATION

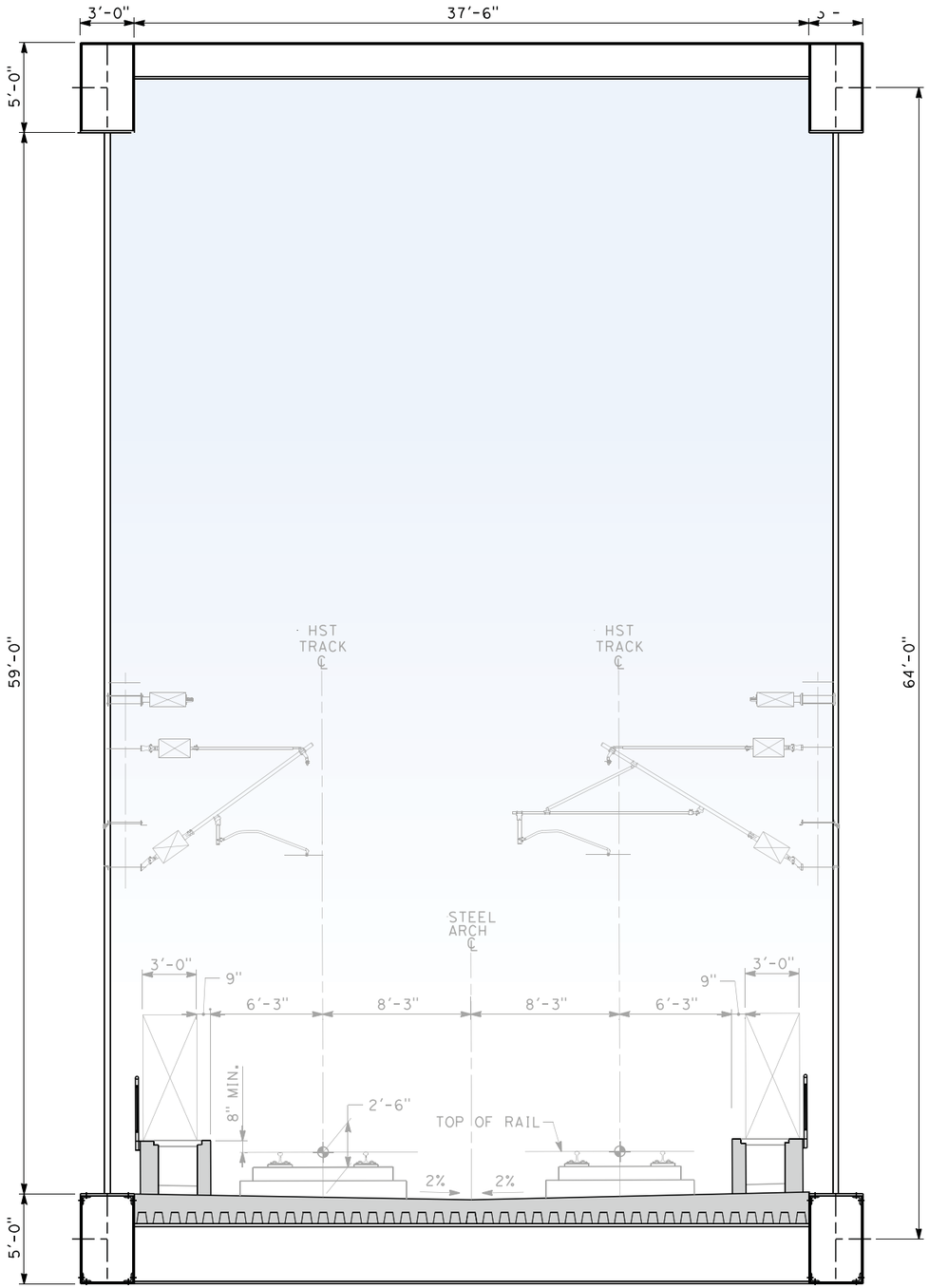
1" = 40'



PLAN

1" = 40'

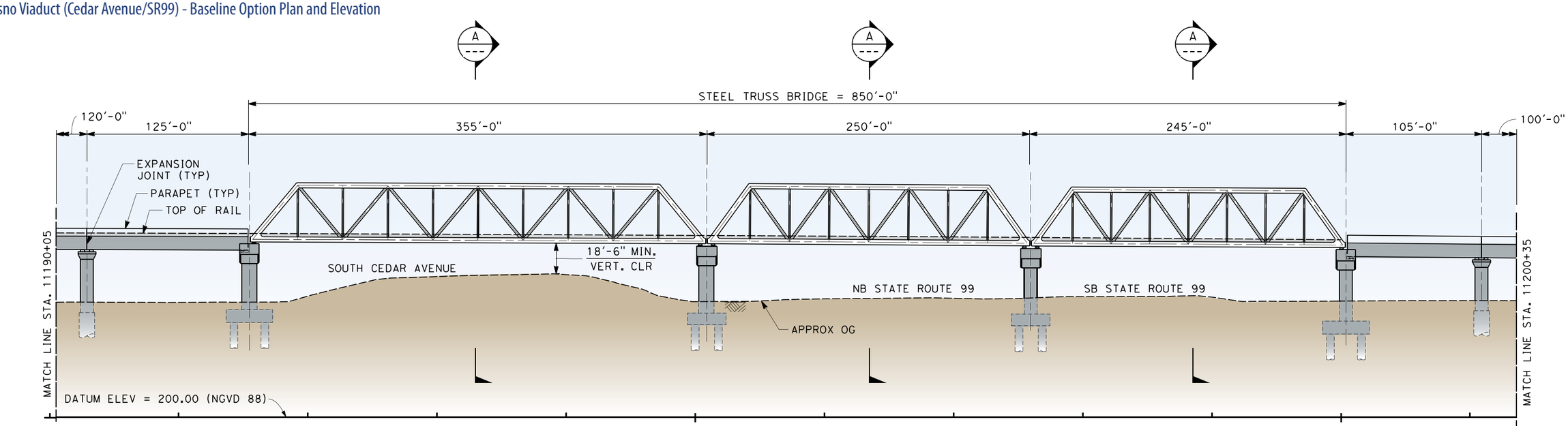
Fresno Viaduct (Golden State Boulevard)-Superior Option Typical Sections



SECTION A-A
1/4" = 1'-0"

Fresno Viaduct Baseline Option - Aerial structure over Cedar Avenue/SR99 with steel truss structure

Fresno Viaduct (Cedar Avenue/SR99) - Baseline Option Plan and Elevation



DEVELOPED ELEVATION

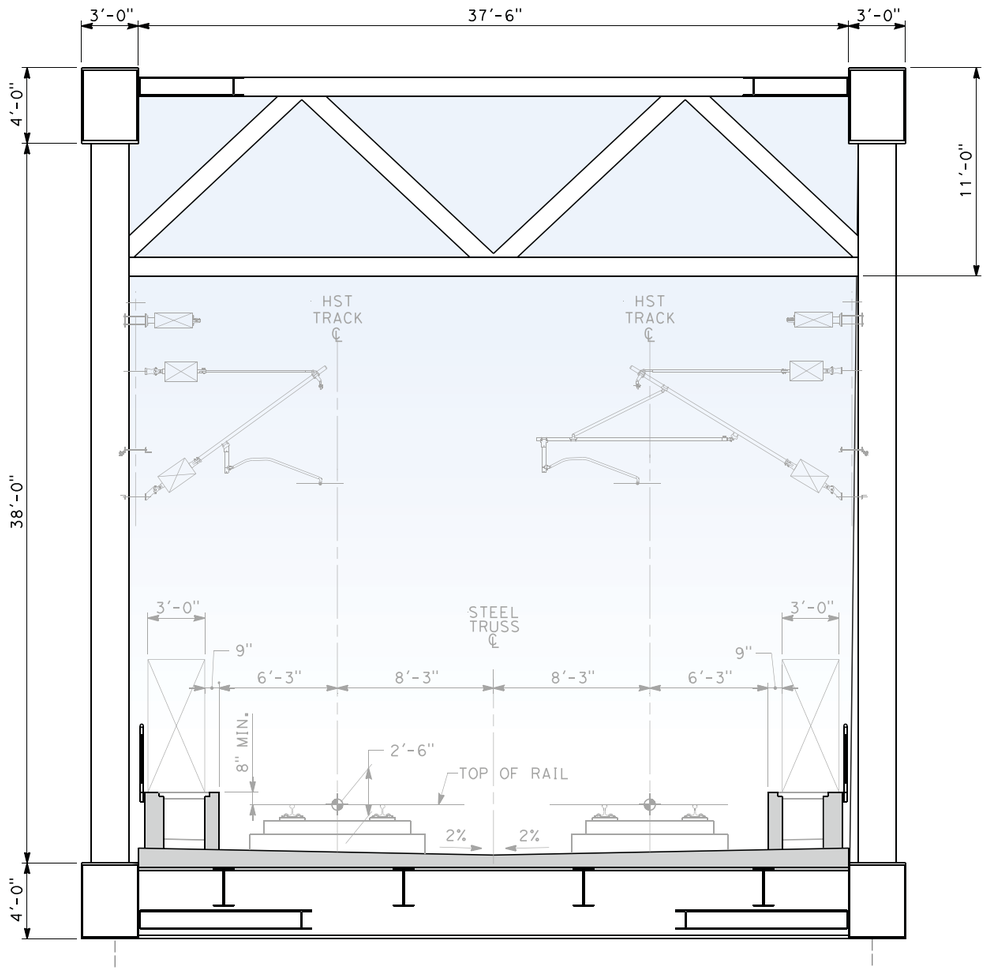
1" = 40'

PLAN

1" = 40'

40 0 40 80
1"=40'
SCALE APPLICABLE FOR FULL SIZE ONLY

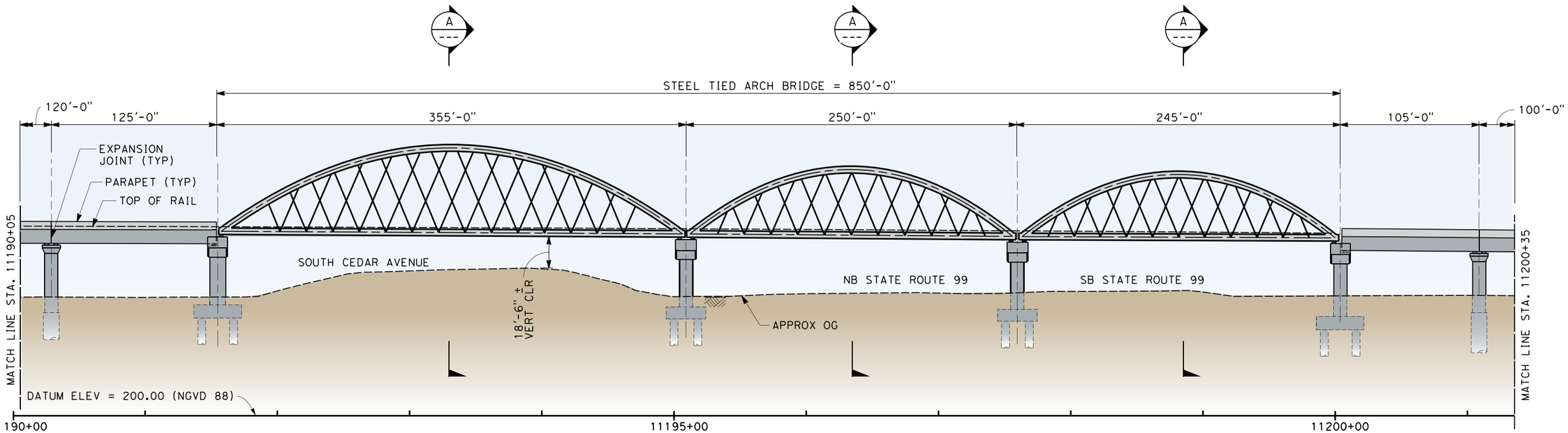
Fresno Viaduct (Cedar Avenue/SR99) - Baseline Option Typical Section



SECTION A-A
1/4" = 1'-0"

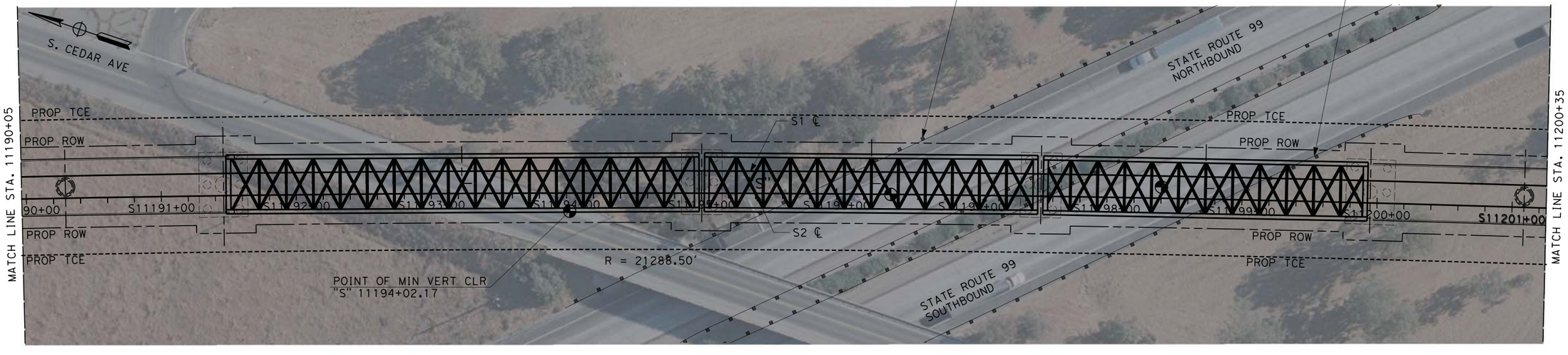
Fresno Viaduct Superior Option - Aerial structure over Cedar Avenue/SR99 with steel tied arch structure

Fresno Viaduct (Cedar Avenue/SR99) - Superior Option Plan and Elevation



DEVELOPED ELEVATION

1" = 40'

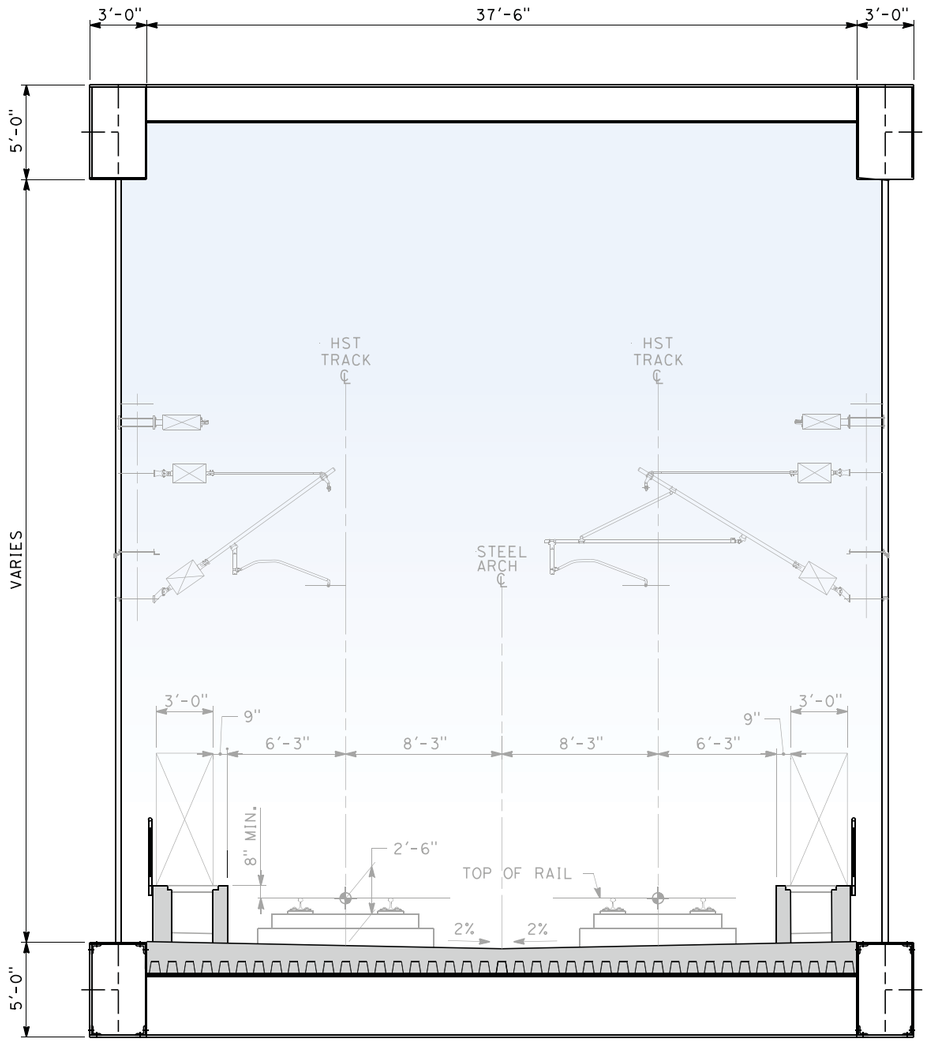


PLAN

1" = 40'

40 0 40 80
1"=40'
SCALE APPLICABLE FOR FULL SIZE ONLY

Fresno Viaduct (Cedar Avenue/SR99) - Superior Option Typical Section



SECTION A-A
1/4" = 1'-0"

ATC 21.1

Eliminate the HST Trench at Jensen Avenue

COST SAVINGS ~$10 MILLION

Description

This ATC proposes to eliminate the HST trench in the vicinity of Jensen and Church Avenues by designing the Jensen and Church Avenue bridges approximately 5 feet higher and utilizing steeper grades. The baseline profile indicates that the HST profile is lowered below existing grade in this area to permit the HST to pass beneath the existing Jensen Avenue overcrossing with the required 24-foot vertical clearance over top of rail. Lowering the profile requires the construction of a U-wall structure to accommodate the lowered HST profile. The HST overcrossing will also need to be relocated approximately 1,000 LF.

This area is in a floodplain, necessitating raising the top of wall elevation to reduce the risk of flooding. A pump station is required to remove storm water runoff from the U wall section. The trench in the reference design is about 7,000 feet long, with top of wall about 5.5 feet above top of rail at maximum.

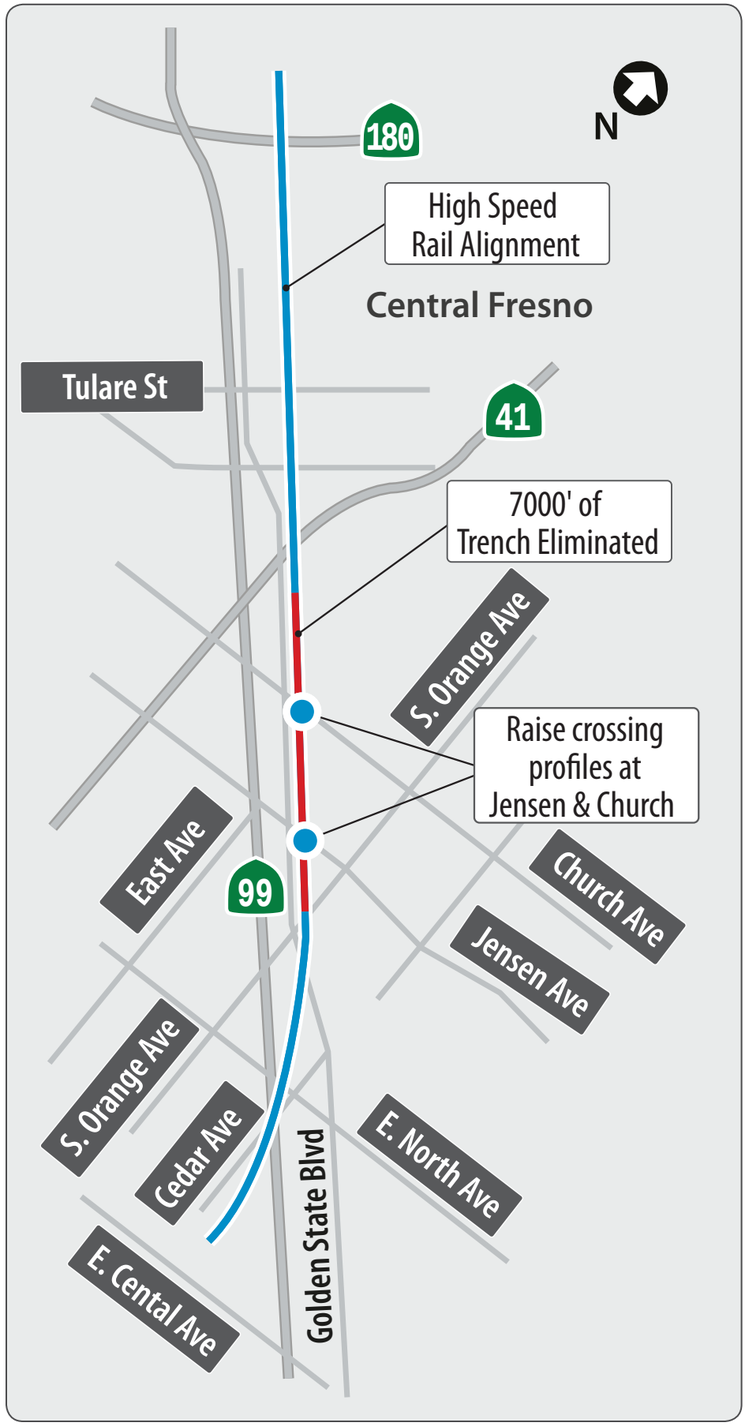
Benefits

The proposed ATC 21.1 to eliminate the trench provides several significant benefits to the HST. Specific benefits are as follows:

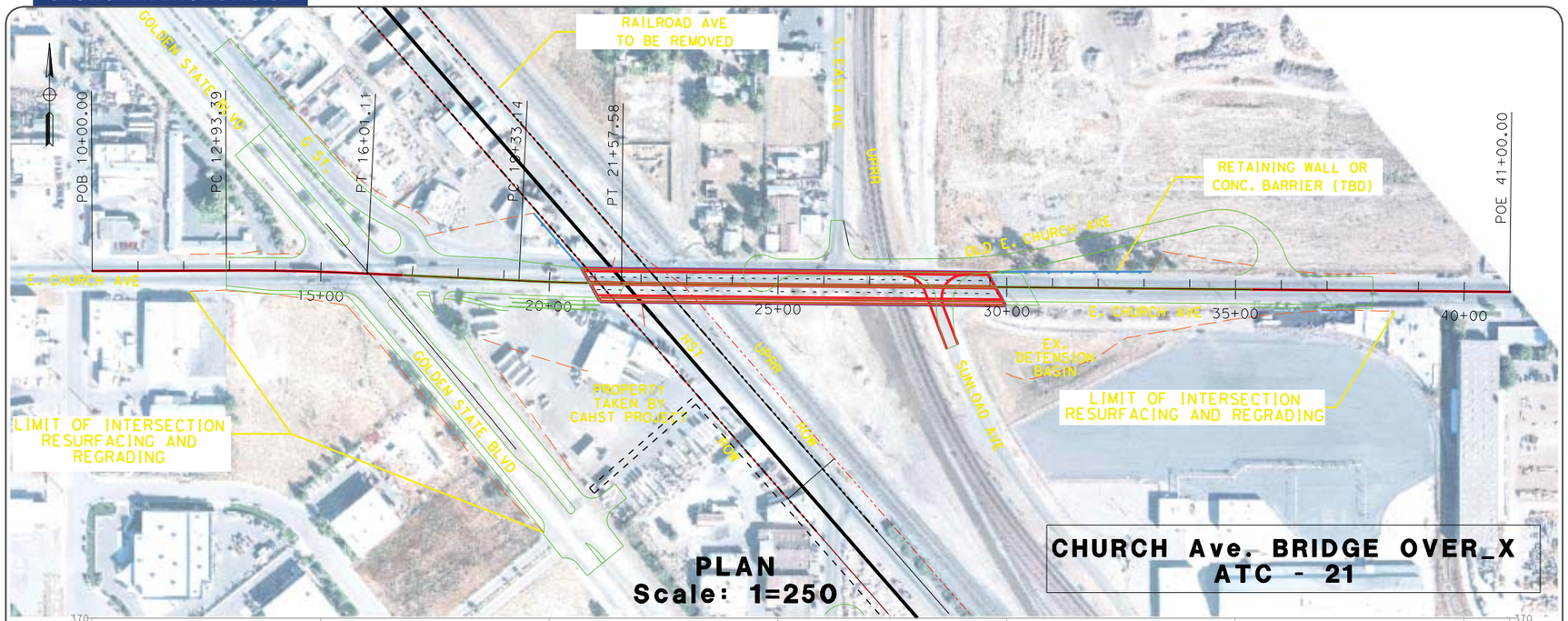
- The proposed ATC eliminates 7,000 feet of trench section, with a savings of approximately $10 million. This sustainable solution reduces long term maintenance of drainage facilities, including a pump station, and reduces environmental impacts.
- By raising the profile and eliminating the trench, the HST has reduced risk of flooding.
- Eliminating the trench eliminates the need to excavate for trench construction.
- This reduces HST exposure and cost associated with potential hazardous materials in the excavation.

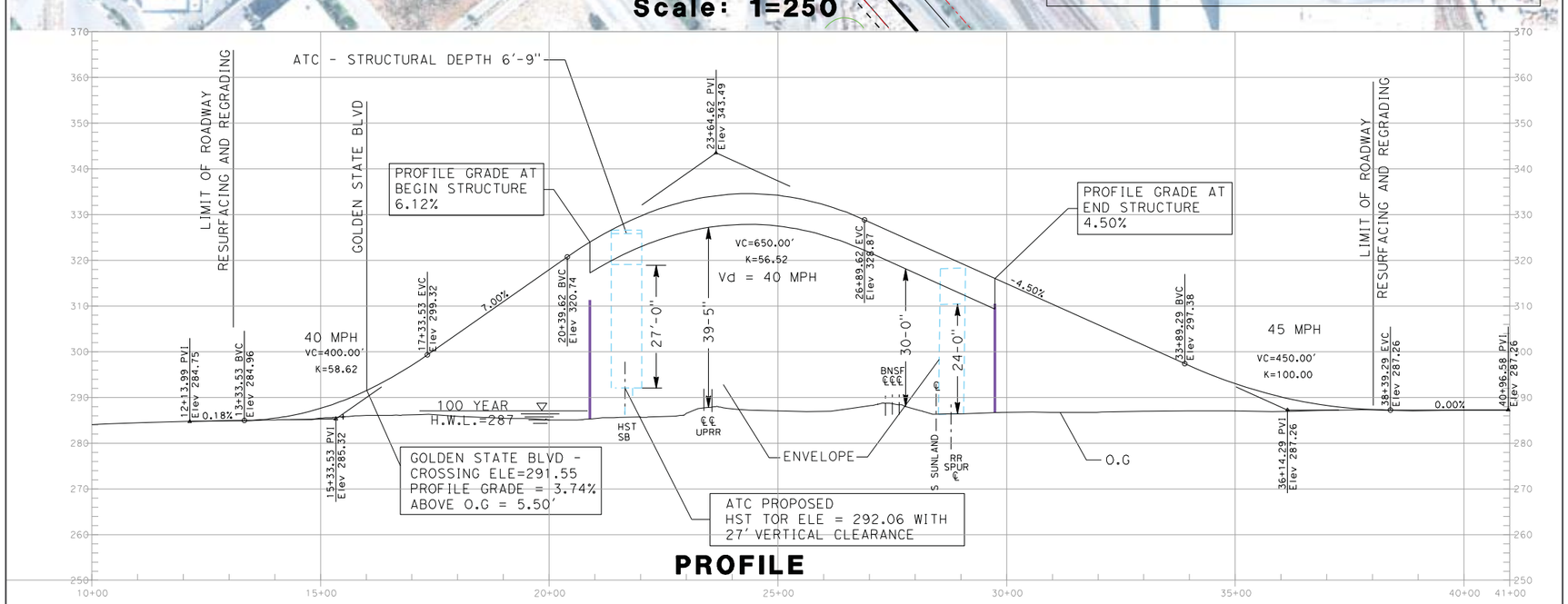
The three conditions placed on this ATC will be met by TPZP:

- Bottom of subballast shall be 2 feet (minimum) above 100-year flood elevation per design criteria
- Demonstrate maintenance of traffic on Jensen Bypass, as roadway shall remain open to traffic at all times and provide proper clearances for Jensen Ave. Bypass: this roadway is designated as Extra Legal Load Network (ELLN) by Caltrans
- Meet City of Fresno requirements for maximum grades and other roadway standards (i.e. 6% maximum for vertical profiles, 2% cross-slope for Golden State Boulevard, meet City's design speeds for Jensen Avenue and Church Avenue).

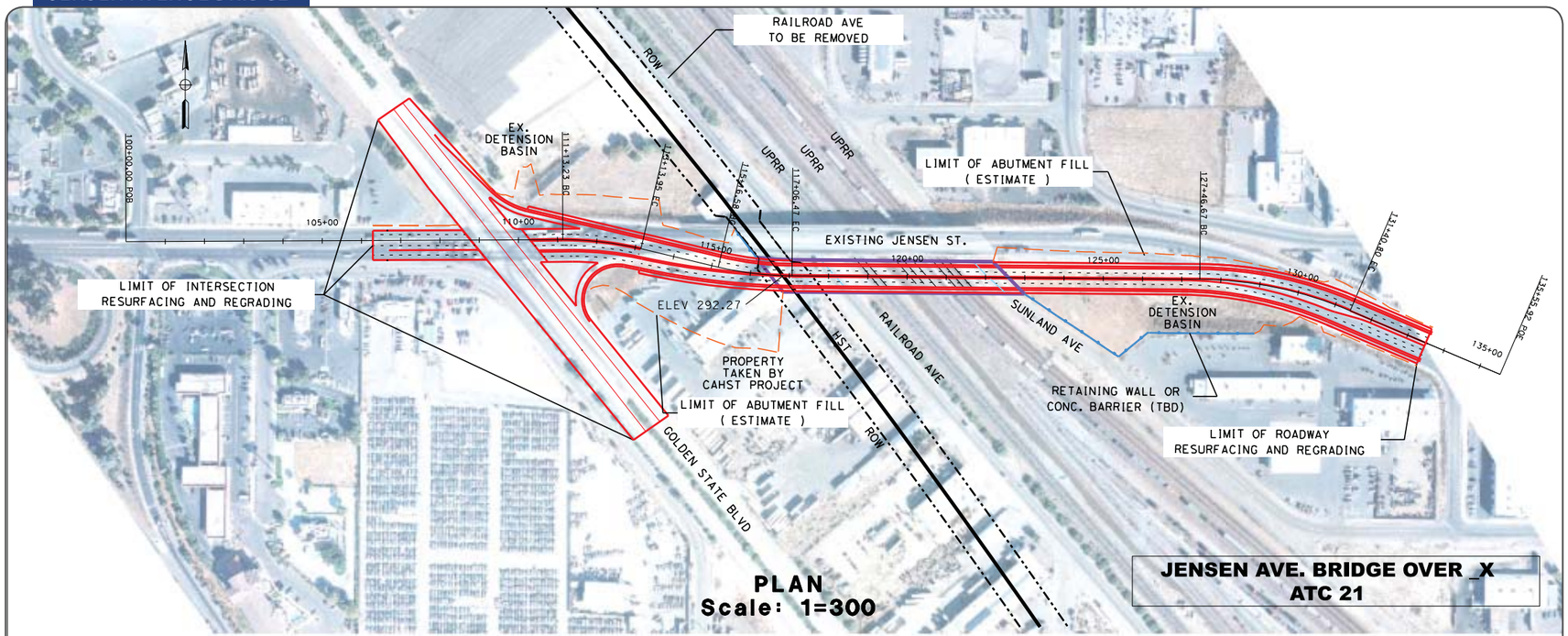


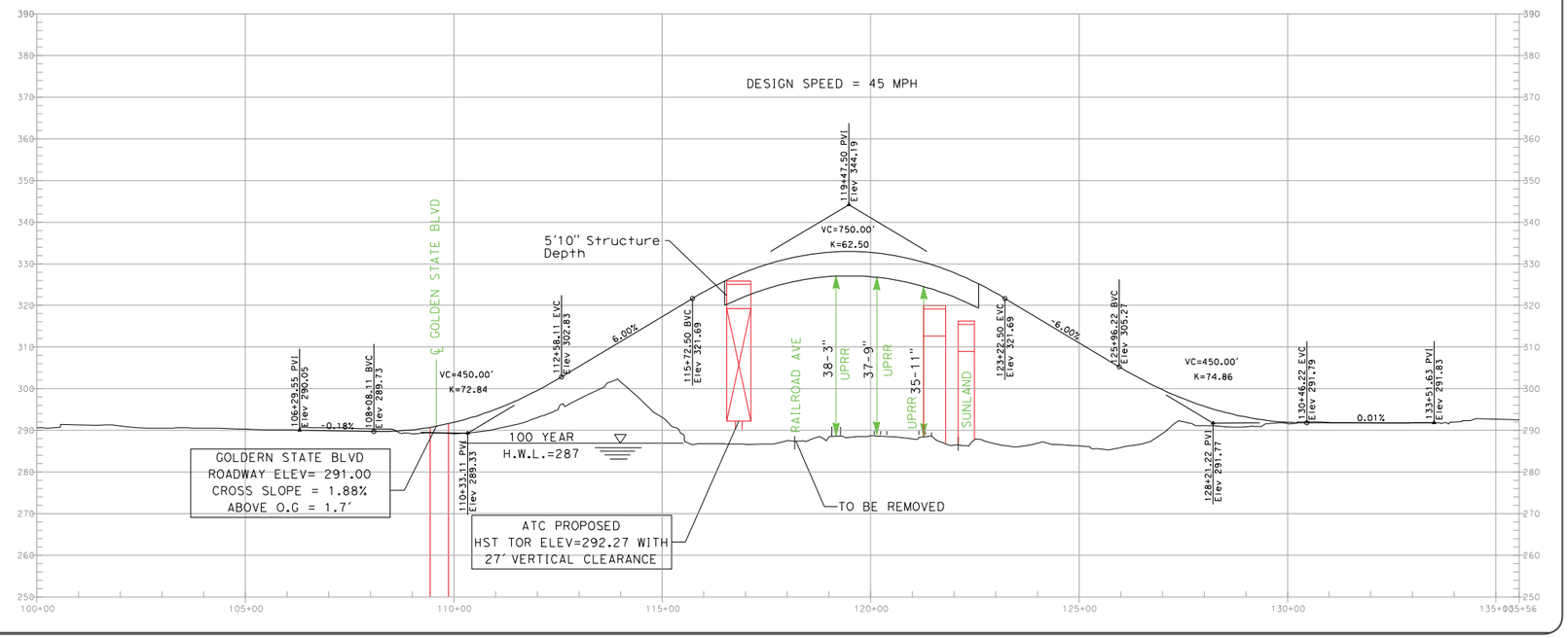
CHURCH AVENUE BRIDGE





JENSEN AVENUE BRIDGE





5. Quality/Self Certification

5. Quality/Self Certification

5.1. TUTOR PERINI/ZACHRY/ PARSONS QUALITY COMMITMENT

The members of Tutor Perini/Zachry/Parsons, a Joint Venture (TPZP), recognize that quality is a key goal for this project and share a common vision regarding quality management. Each firm has long-standing commitments to quality and quality management systems (QMSs) that fully support the requirements of the California High-Speed Rail Initial Construction Section, Construction Package #1 (CAHSR CP1) project. TPZP will develop a QMS based on ISO 9001:2008 and the Federal Transit Administration Quality Assurance and Quality Control Guidelines, FTA-IT-90-5001-02.1.

The QMS will overlay Tutor Perini's process for quality assurance (QA) and quality control (QC) on design-build projects. This process is made up of four parts: a project quality plan (PQP), a design quality management plan (DQMP), a construction quality management plan (CQMP), and a QA plan. This process was successfully implemented in California on such projects as the $609 million BART SFO Extension. This project was led by an International Register of Certificated Auditors (IRCA)-accredited ISO 9000:2000 lead auditor employed by Tutor Perini. The project received a top rating from the Federal Transit Administration (FTA) senior oversight engineer, who noted that the quality management system program was exceptional.

Zachry defines project requirements and operates in accordance with corporate quality goals and objectives. Zachry's quality goals and objectives are simply stated: execute work scopes right every time, while exceeding expectations. Zachry measures its performance against corporate objectives, striving for continuous improvement.

Parsons is an ISO 9001:2008-certified corporation. Receiving and maintaining this certification requires Parsons to have a QMS that meets ISO standards. Every six months, an independent auditor from an ISO registrar randomly selects projects to be audited for compliance with the ISO 9001:2008 standard. Any project undertaken by Parsons is covered by this certification and must comply with the approved Parsons QMS. Parsons' QA procedures incorporate the most effective means of providing quality design and construction services to clients.

ISO 9001:2008

Parsons is an ISO-certified firm and will base the QMS on the latest quality standards. Tutor Perini and Zachry work in ISO-compliant environments.

> Joint Venture Quality Policy: TPZP is committed to providing quality services and products. We will meet the project requirements the first time and strive for continual improvement of our work processes.

5.1.1. TPZP Quality Process Overview

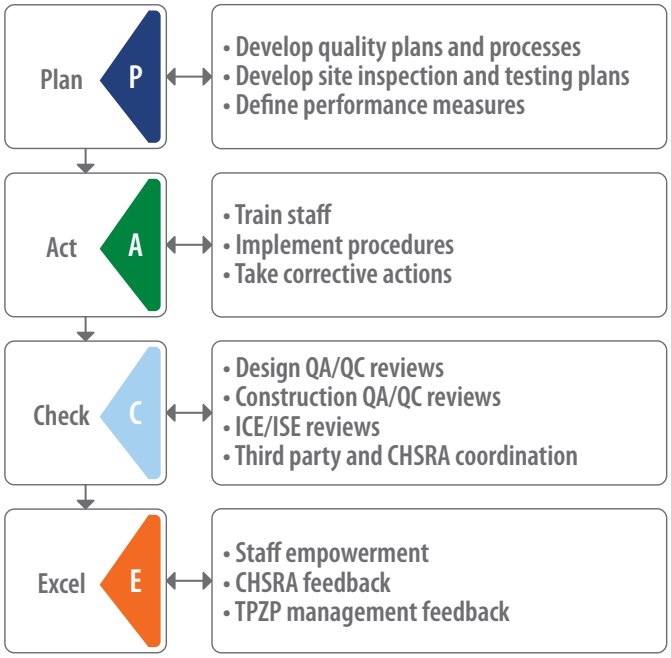
The TPZP quality management process for this project reflects our best practices for quality management on previous award-winning projects. The basic process sets the standards for achieving mutually agreed-to requirements on a project and improving project performance. The process includes four essential steps and is illustrated in Figure 5-1. On a TPZP project, quality is the responsibility of the entire team organization; requires documentation, communication, and procedure training for all participants; requires thorough checking, including validation and verification of all items to contract requirements; and applies lessons learned from previous projects.

5.1.2. TPZP Quality Objectives

TPZP will meet and exceed all project requirements based upon its extensive experience. On a corporate level, the quality processes are established, and experienced staff is available. Our objectives for quality include the following:

- Provide a design and construction team that has experience with a mature, well-tested, and certified ISO 9001:2008 quality process to eliminate rework by getting the job done right the first time.
- Organize and conduct quality management recognizing the unique roles that both QC and QA have in the design and construction process.

Figure 5-1: PACE Quality Management Road Map



- Have the TPZP Quality Manager, Ben Fardi, PE, report directly to the officer-in-charge, to be independent from the design and construction production staff.
- Employ a quality manager who will ensure the full implementation by TPZP of any process changes in response to comments and/or a quality audit issue.
- Provide 83 experienced quality full-time employees to ensure timely response to all quality issues, such that project priorities, obligations, and the schedule are satisfied. See Figure 5-2.
- Incorporate a robust environmental compliance checking and monitoring process to ensure that all EIS/EIR commitments are satisfied and any compliance issues that arise during design or construction are resolved in a timely manner.
- Include a comprehensive validation and verification (V&V) process to ensure that all CHSRA and third-party specifications and procedures are incorporated throughout the project and have been reviewed by quality staff and production staff.
- Engage the independent checking engineer/independent site engineer (ICE/ISE) staff to review before submittal to third parties and the California High-Speed Rail Authority (CHSRA).
- Make quality a top priority by empowering all personnel to recommend a hold on both the design and construction when needed.
- As a value-added benefit, engage a quality task force, including the Quality Manager, all QC and QA managers, the Verification and Validation (V&V) Manager, the ICE/ISE Manager, the Project Manager/Director, the Design Manager, the Construction Manager, the Officer-in-Charge, and the CHSRA representatives to review and resolve design and construction submittal issues promptly and in a team atmosphere.

TPZP clearly understands the requirements of the contract agreement as they apply to the performance of the work given our team's experience in California and throughout the United States.

To comply with contract requirements, TPZP is committed to a four-level quality process with a seasoned team of 83 full-time quality professionals independent of production staff.

5.2. DESIGN AND CONSTRUCTION QUALITY MANAGEMENT ORGANIZATION

5.2.1. Four-Level Quality Process

TPZP will proactively implement the project quality program to prevent and eliminate all substandard and nonconforming design, fabrication, and construction. To meet these standards, we will establish four distinct quality teams, each with separate and defined duties, responsibilities, and authorities on the project. They include the QC team, the QA team, the V&V team, and the ICE/ISE team. In addition, there will be an environmental compliance (EC) team that will ensure that all design and construction work complies with the environmental requirements along the corridor. The following defines each quality function.

Quality Control (QC): Comprises the actions related to the physical characteristics of materials, elements of the work, systems, and equipment and provides a means of verification. QC verifies that the work complies with the requirements through inspection and testing.

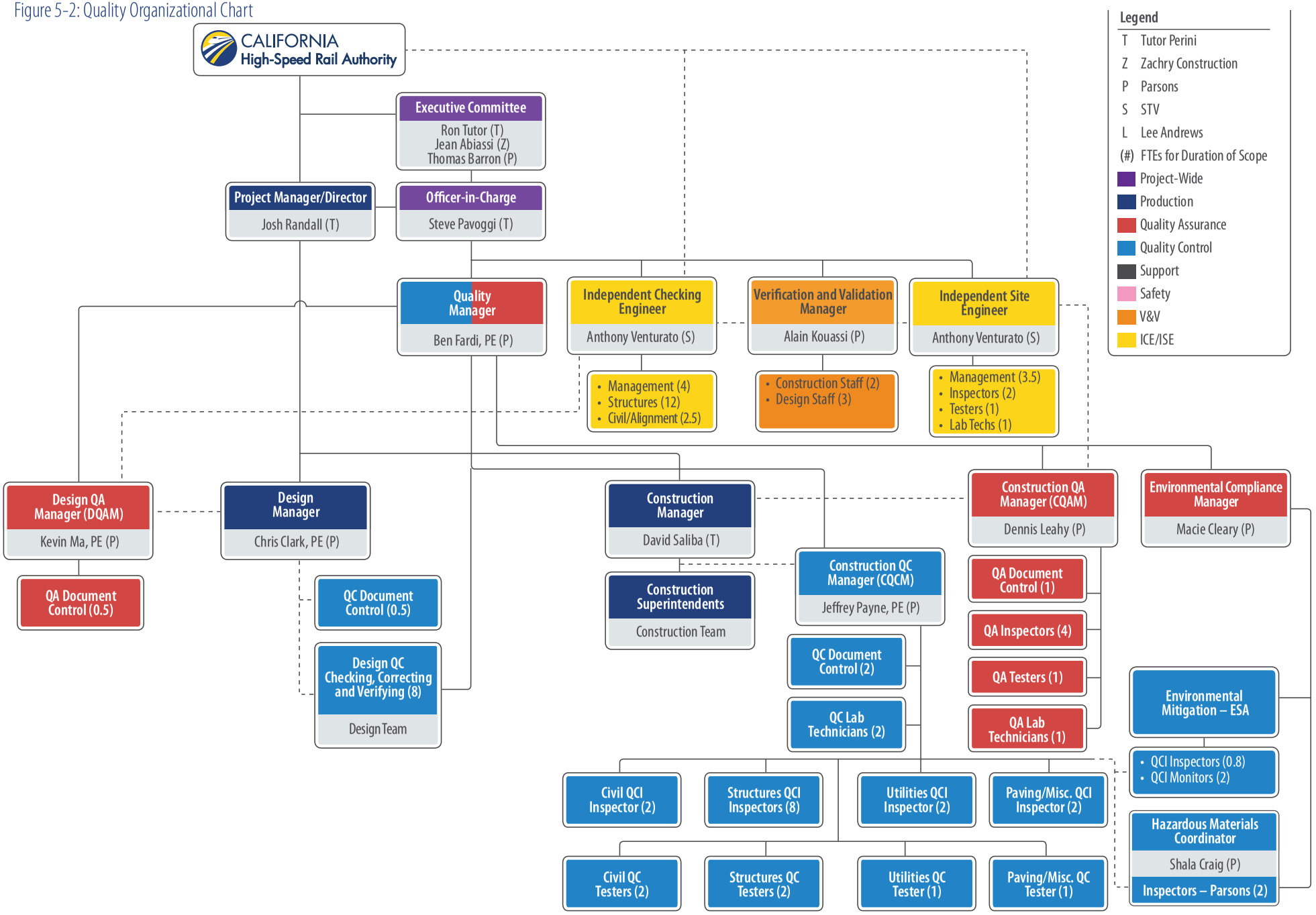
Quality Assurance (QA): Comprises the actions related to oversight, validation, and documentation of the QC processes to ensure conformity.

QC and QA also includes environmental compliance (EC). This consists of QC monitors during construction, including wildlife and fish biologists, noise/vibration specialists, water quality monitors, archaeologists, paleontologists, hazardous materials monitors, and historic resource monitors. As a member of the QA team, the Environmental Compliance Manager (ECM) will develop the EC quality plan and oversee the QC monitors.

Validation and Verification (V&V): Comprises a review, documentation, and self certification process for design and construction inspection and testing, using proven systems engineering techniques applied to the civil and structural project aspects, thereby ensuring that all contract requirements are satisfied.

Independent Checking Engineer/Independent Site Engineer (ICE/ISE): Comprises the independent V&V staff defined by an ICE and ISE

Figure 5-2: Quality Organizational Chart



team that will assess and evaluate the design and construction submittals and determine whether construction QC/QA meets the project requirements. The ICE and ISE are under contract to TPZP but are independent of TPZP and work on behalf of the CHSRA.

5.2.2. Self-Certification Submittal Process

The TPZP four-level quality team is organized to coordinate and complete the self-certification process using the following steps for each contract submittal (including released-for-construction, final design, construction, inspection, and test submittals) as illustrated in Figure 5-3 and listed below:

- TPZP prepares a submittal, completes QA/QC, and self-certifies compliance with contract requirements.
- TPZP completes a V&V submittal and submits to the ICE/ISE.
- ICE/ISE evaluates the submittal in order to certify that contract requirements are met, submits its report and certification to the CHSRA, and copies TPZP.
- TPZP sends the submittal with QA/QC, V&V, and ICE/ISE documents and self-certification to the CHSRA's representative.
- The CHSRA's representative performs audit and re-review and issues a Statement of No Objection (SONO), if complete.
- Throughout the process, TPZP convenes its value-added quality task force, which includes management staff from each of the four quality teams, the production team, and the CHSRA to review and resolve comments before proceeding to enhance the timeliness and completeness of the quality process.

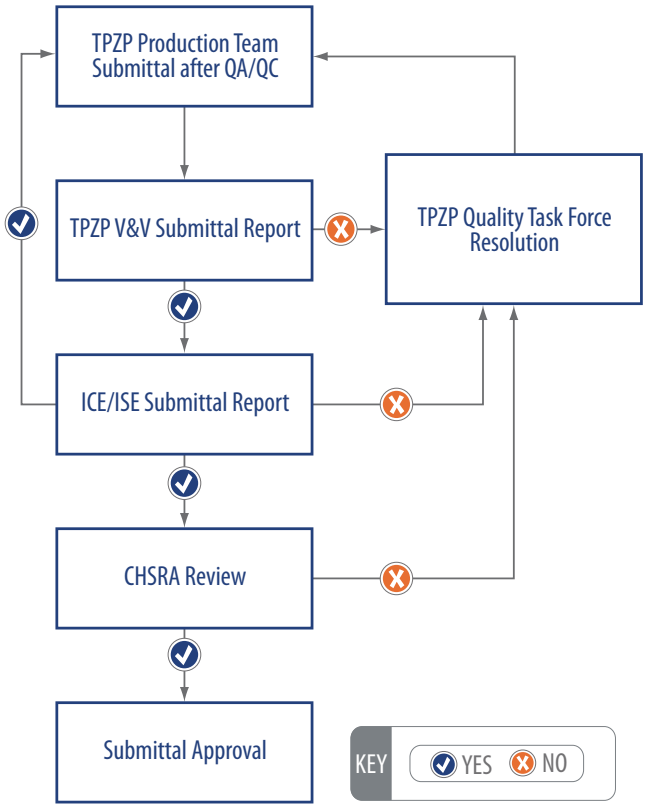
The processes involved in the QA/QC, V&V, and ICE/ISE reviews and approvals are described in sections 5.3 through 5.7.

> The entire project team will be empowered and held responsible for identifying quality problems, stopping work that is not in compliance, and requiring corrective actions.

5.2.3. TPZP Quality Organization

The TPZP executive committee has empowered the Project Manager/Director, Josh Randall, to design and build the project to the requirements of the project, Federal Rail Administration (FRA) standards, and all applicable local, state, and federal regulations and laws. The executive committee will delegate authority and responsibility to the Quality Manager, Ben Fardi, to develop and implement a quality management plan (QMP) governing QC and QA, consistent with the contract. The executive committee will direct Josh to use the QMP in the design QC and construction QC of the project and to show compliance with the CHSRA's requirements. Quality Manager

Figure 5-3: Self-Certification Submittal Process



Ben Fardi will report to Officer-in-Charge Steve Pavoggi in order to provide the project QC/QA function independence from the production team lead by Josh Randall.

The executive committee has also delegated authority and responsibility to the quality organization to implement this QMP in order to help accomplish the following:

- Prevent nonconformance(s) during design and construction
- Certify that suppliers and subcontractors are informed of and meet the project requirements for products and services
- Verify that the quality inspection and testing activities are providing proper information
- Provide confidence to the CHSRA that design and construction are meeting project requirements and applicable standards

As shown in Figure 5-2, TPZP has structured the quality management organization as an integrated team, with authority delegated to those individuals most capable of ensuring quality. Table 5-1 lists the number of personnel (FTEs) that TPZP will use to ensure quality and self-certification. This is followed by summaries of the key quality personnel assigned by TPZP.

Ben Fardi – Quality Manager (QM)

The Quality Manager, Ben Fardi, will serve as an extension of the officer-in-charge. Ben will oversee the implementation and function of the project-wide QA/QC program. He will be responsible for compliance with the

Table 5-1: Quality/Self-Certification Full-time Employees

OVERALL QUALITY MANAGEMENT	
Quality manager	1
DESIGN QUALITY CONTROL	
Design manager/Quality control coordinator	1
Design checking, verifying, and correcting	8
Document control	0.5
DESIGN QUALITY ASSURANCE	
Design quality assurance manager	1
Document control	0.5
CONSTRUCTION QUALITY CONTROL	
Construction quality control manager	1
Document control	2
Lab technicians	2
Quality control inspectors	14
Quality control testers	6
CONSTRUCTION QUALITY ASSURANCE	
Construction quality assurance manager	1
Document control	1
Quality assurance inspectors	4
Quality assurance testers	1
Quality assurance lab technicians	1
ENVIRONMENTAL COMPLIANCE	
Environmental compliance manager	0.4
Quality control inspectors, biologists, etc.	2
Quality control inspection monitors, paleontologists, archeologists	0.8
Hazardous materials coordinator	1
Hazardous materials inspectors	2
VERIFICATION AND VALIDATION	
Verification and validation manager	1
Verification and validation design review engineers	3
Verification and validation construction review engineers	2
INDEPENDENT CHECKING ENGINEER/ INDEPENDENT SITE ENGINEER (ICE/ISE)	
Independent checking engineer/independent site engineer manager	1
Management support	6
Structures checking/review	12
Civil/alignment checking/review	2.5
Inspectors	2
Testers	1
Lab technicians	1
TOTAL FTES	**83**

quality requirements of the contract, including direct oversight of TPZP's quality program for all design, preconstruction, and construction activities.

Ben Fardi's QM responsibilities include the following:

- Supervising the TPZP team's allocation of quality resources
- Implementing, maintaining, revising, and modifying the QMP as needed
- Conducting daily, weekly, and monthly quality meetings
- Documenting and participating in preparatory meetings and inspections
- Reviewing and certifying the daily contractor's QC report
- Reviewing and certifying construction submittals
- Managing all required quality record documents
- Issuing nonconformance reports
- Coordinating and conducting quality-related training

Quality Manager - Ben Fardi, PE

With more than 28 years of experience, Ben will ensure that the CAHSR CP1 project is built to the highest quality standards. He has served as quality manager on similar projects, such as the Alameda Corridor Mid-Corridor Trench with Tutor Perini and the Los Angeles to Pasadena Metro Blue Line projects.

Kevin Ma – Design QA Manager (DQAM)

Kevin Ma will serve as the Design QA Manager. As the DQAM, Kevin will report directly to the Quality Manager, Ben Fardi. Kevin will also work closely with the Design Manager, Chris Clark. As the DQAM, Kevin will be responsible for the conformance and compliance of the design QC program through oversight and audit. Kevin's DQAM responsibilities will include the following:

- Establishing, implementing, and maintaining the design quality management plan (DQMP) procedures
- Scheduling and performing audits
- Reviewing and commenting on all design submittals, including those from third parties
- Issuing stop-work orders during design, if needed
- Reviewing subconsultant design quality plans
- Coordinating and conducting quality-related training for all design firms

The Quality Manager, Ben Fardi, and the DQAM, Kevin Ma, have worked on projects together before, including the BART Oakland Airport Connector project. This project is a $365 million design-build project that connects the BART Coliseum Station to the Oakland International Airport on a 3.2-mile-long automated people mover (APM). Ben Fardi and Kevin Ma also worked

together on the Mid-City Exposition Light Rail Transit project. This was an $868 million design-build project that involved a new 7.44-mile extension to the existing metro system, from downtown Los Angeles to Culver City, in Los Angeles, California.

DQAM - Kevin Ma, PE

Kevin has 34 years of experience and expertise in quality systems, compliance, design, and construction. He recently served in similar quality roles on the Mid-City Exposition Light Rail Transit, the Caltrain Downtown Extension, and the BART Oakland Airport Connector projects, where his responsibilities included training project personnel, preparing project design quality management plans and procedures, and performing project audits.

Chris Clark – Design Manager/Design QC

Design QC consists of detailed design review, which will be performed by the design leads as directed by the Design Manager. Design leads ensure that the work is being designed according to the contract. Design QC includes the methodical checking of design calculations, plans, specifications, reports, etc., by designers who may be working on a different part of the project. This also includes interdisciplinary reviews, constructability reviews, peer reviews, and other applicable reviews, such as for design-related environmental requirements. The checking and reviews will follow project-specific design quality management plan (DQMP), which is founded on Parsons' ISO 9001:2008 quality standards. The design leads will have sufficient authority and organizational freedom to identify quality problems, to stop nonconforming design work, and to verify that the approved solutions have been implemented.

Jeffrey Payne – Construction QC Manager

As the TPZP Construction QC Manager (CQCM), Jeffrey Payne, PE, will be authorized by the Officer-in-Charge and will report directly to the Quality Manager, Ben Fardi. Jeffrey will have the authority to issue warranted stop-work orders and the autonomy to direct the removal and replacement of defective and/or inferior work product.

Jeffrey's CQCM duties and responsibilities will include the following:

- Supervising project QC inspectors
- Scheduling quality inspections and testing, and witness them where required
- Reviewing certifications and test reports
- Preparing daily contractor's QC reports
- Supervising and tracking deficiency notices
- Issuing nonconformance reports and maintaining logs through closure
- Maintaining updated, working as-built drawings and auditing subcontractors, subconsultants, material suppliers, contracted third parties, and vendors for compliance

Jeffrey will work closely with Construction Manager David Saliba and his superintendents on all construction QC issues. Any issues between the CQCM and the construction manager requiring resolution will be resolved by Officer-in-Charge Steve Pavoggi.

QC inspectors (QCIs) assigned to the project will monitor the daily construction activities. At a minimum, the QCI responsibilities and duties will include performing pre-activity inspections and material inspections, executing daily QC reports, coordinating with testing laboratories, reviewing and processing field test data, and inspecting and witnessing the work. QCIs shall have sole responsibility of signing off on all applicable hold points. The inspectors shall be the final signature on all checklist documents and will assist in monitoring QC processes during construction.

QC testing personnel assigned to the project will perform QC tests for construction processes and activities at the frequency specified in the inspection and test plan for material control necessary to meet contract requirements. The QC testers are qualified and certified by the State of California Department of Transportation. Each qualified tester will hold a current certificate of proficiency for the test(s) he/she performs. The certificates of proficiency are maintained as part of the TPZP QC program. Each tester shall have sole responsibility to sign off on all hold points.

CQCM – Jeffery Payne, PE

With more than 27 years of experience, Jeffery will manage and supervise the construction QC program. His responsibilities have consisted of the construction inspection, supervision, and management of several projects within California, including the $1.25 billion TRIP/Bakersfield Program Management contract. Jeff was also the resident engineer on the SR 180 and SR 41 projects in Fresno.

Dennis Leahy – Construction QA Manager (CQAM)

To ensure compliance, Dennis Leahy will serve as the Construction QA Manager (CQAM). In this role, Dennis will be authorized by the officer-in-charge and will report to Quality Manager Ben Fardi. The CQAM shall have sufficient authority and organizational freedom to identify deficiencies in the quality processes, to recommend and initiate potential solutions, and to verify that the approved solutions have been implemented. To ensure compliance with the requirements of the CQMP, the CQAM will be responsible for the general oversight of the QA inspectors (QAI) and the QA testing laboratory (QATL).

As CQAM, Dennis' duties will include the following:

- Auditing QC function(s)

- Scheduling and maintaining records of verification testing, inspections, and surveys
- Documenting audit findings
- Witnessing and participating in the three-phase inspection process
- Auditing subcontractors, subconsultants, third-party entities, and material suppliers
- Issuing audit findings
- Maintaining reporting logs

TPZP will employ the services of QAIs in specific categories, such as earthwork, structural steel, drainage, utilities, rebar, and concrete. The lead QAI will monitor daily field activities and will be authorized by and report to the CQAM. The primary responsibilities of the QAIs are to audit QC functions and to document representative samples of the work to ensure compliance with the QMP and contract requirements.

CQAM – Dennis Leahy

With more than 30 years of experience in design and construction QA/QC, Dennis Leahy will manage the construction QA process. Dennis's experience includes similar roles on the $259M Miami Airport Automated People Mover project and the $1.3 billion I-25 T-REX design-build project.

Macie Cleary - Environmental Compliance Manager (ECM)

Macie Cleary will manage the preparation of the Environmental Quality Management Plan, which will include all compliance requirements, as detailed in the environmental documents. A draft plan will be submitted to the CHSRA within 90 days of notice to proceed (NTP) and will be finalized before the commencement of any construction activities. The plan will include a detailed list identifying each environmental approval and commitment. The plan shall detail environmental roles and responsibilities of all entities involved in the project. Macie will implement all applicable environmental compliance requirements.

As ECM, Macie's duties will include the following:

- Preparing the environmental quality management plan
- Maintaining a tracking database of all mitigation measures, their permit requirements, and final resolutions
- Obtaining all environmental permits, licenses, and agency approvals
- Conducting environmental training and maintaining training records of field personnel
- Coordinating, communicating, and monitoring the required environmental activities with the design and construction production staff
- Effectively resolving mitigation concerns and satisfying agency issues
- Supervising the environmental monitors and inspectors
- Preparing weekly and monthly reports on environmental mitigation progress

Macie will conduct QA for environmental compliance, reporting to Quality Manager Ben Fardi and will manage a team of environmental mitigation compliance monitors and inspectors in cooperation with the QC team. This team of compliance monitors will observe and prevent construction-based negative impacts to protected plants and wildlife, community-based air quality and noise impacts, vibration impacts to historic structures, and known hazardous materials. She will also monitor any archeological and paleontological finds.

ECM – Macie Cleary

Macie Cleary has 26 years of experience and will manage the environmental compliance program. She oversaw the implementation of environmental mitigation and regulatory permits for the 24-mile, $600 million Orange County toll road design-build construction project. She also served as the environmental lead for the $1.2 billion I-405 Improvement PA/ED project in Orange County.

Alain Kouassi – Verification and Validation Manager

The third quality team is verification and validation (V&V), led by Alain Kouassi. V&V will provide evidence that the project meets its specified requirements in all respects. Verification confirms that the infrastructure is properly designed and built by TPZP, and validation is a check to ensure that the right infrastructure and subsystem elements have been constructed. The TPZP V&V process is further described in section 5.7.

The V&V Manager reports to the Officer-in-Charge, Steve Pavoggi. Alain's duties include the following:

- Developing and monitoring the V&V plan
- Implementing a requirements management process for all contract elements using IBM Rational DOORS software
- Identifying and monitoring all discipline interface requirements
- Defining a change management process for all changes
- Overseeing the testing and inspection plan
- Identifying all certifiable elements and tracing and maintaining their compliance with technical requirements
- Verifying, validating, and self-certifying documents for each TPZP submittal

To ensure that V&V and self-certification is achieved, Alain will coordinate with an ICE for design review and an ISE for construction review.

Verification and Validation Manager – Alain Kouassi

Alain Kouassi has 22 years of experience in system integration management, including the $550 million Mid-City Exposition Light Rail Transit project in Los Angeles. His experience includes developing and managing V&V processes, including requirements management, design coordination, interface management, configuration management, testing and commissioning, and safety certification.

Anthony Venturato – ICE/ISE Manager

The fourth quality team is ICE/ISE, led by Anthony Venturato. The ICE/ISE functions will be performed by STV, Inc., with no personnel involved in aspects of the design or construction production. Being independent, the ICE/ISE also meets and files reports directly to the CHSRA.

The ICE and ISE's assessments and evaluations of design and construction will be sufficient to certify to TPZP and the CHSRA that the design and construction satisfies the contract requirements, including the following: accuracy, adequacy, conformance to standards of practice, compliance with codes and standards, cost effectiveness, quality, and fitness for purpose and/or function.

The ICE/ISE's verification and validation activities include assessment and evaluation of the following:

- Contract management related submittals
- Design submittals at each milestone
- Construction inspection and testing plans and procedures
- Witness construction testing/acceptance and check reports
- As-built documents

ICE/ISE Manager – Anthony Venturato

Anthony has 40 years of experience in transportation projects. This includes serving as the FTA project management oversight manager for the $1.5 billion BART SFO project, and as the engineering manager for the CHSRA Los Angeles to Anaheim segment EIR/EIS.

5.3. DESIGN AND CONSTRUCTION QUALITY PROCESS

TPZP will administer design QA/QC processes through the office of the Quality Manager, Ben Fardi, and in concurrence with the project QMP. Managing the design QA/QC process and construction QA/QC process will also include inspection and testing, the sharing of results, and the use of notice of defect and nonconformance procedures.

5.3.1. Design QC Process

Our Design Manager, Chris Clark, PE, and our DQAM, Kevin Ma, PE, will develop a project-specific DQMP, based on ISO 9001:2008 standards, in coordination with design discipline leads and the design manager. The design team, under the direction of Chris Clark, will perform all required checks and reviews in accordance with the approved DQMP. The TPZP design production staff will use a QC process that meets project requirements and clearly identifies individual roles and responsibilities. The DQMP will specify the levels, frequency, and methods for specifically checking and reviewing the design adequacy of the CAHSR CP1 project.

Design is governed by contract requirements and by existing conditions. As designs are developed, we will verify pertinent dimensions in the field necessary for the preparation of respective work. Field verification will be conducted before the review of design plans, project specifications, and working plans.

Qualified individuals review all design input requirements for adequacy. Any incomplete, ambiguous, or conflicting requirements are resolved before proceeding. The design staff review design input data and approve it before using the information in the design. Discipline-specific design criteria compliance checklists, which identify the standards and references and project-specific requirements, establish basic design and performance requirements to be used in the design and construction of the project. These checklists are completed for each design element.

All hand and computer calculations are checked in accordance with design quality procedures. Calculations are checked for compliance with design input requirements, including assumptions, mandated parameters, references, given values and formulas, and for appropriate level of completeness. They are also checked for omissions and correctness of arithmetic. The checker is responsible for asking questions of the originator in areas that are not clear or seeking technical advice if unsure of any particular element of the calculation.

The design quality review process, including the QC, QA, V&V, and ICE elements, is illustrated in Figure 5-4. To meet the design deliverable schedule, the design will be progressed from 30 percent to 60 percent, 90 percent, and 100 percent, the last to be issued as released-for-construction deliverables. At the 60 percent submittal phase, the Design Manager will order the package assembled for submittal (to include the basis of design report [BDR]). The 60 percent and 90 percent design submittals will undergo the QC process, as well as interdisciplinary and constructability reviews by other discipline leads and construction staff. At 100 percent, issued/released for construction, the Design Manager will again order packages assembled for submittal to undergo internal QC process confirmation, as prescribed in the DQMP.

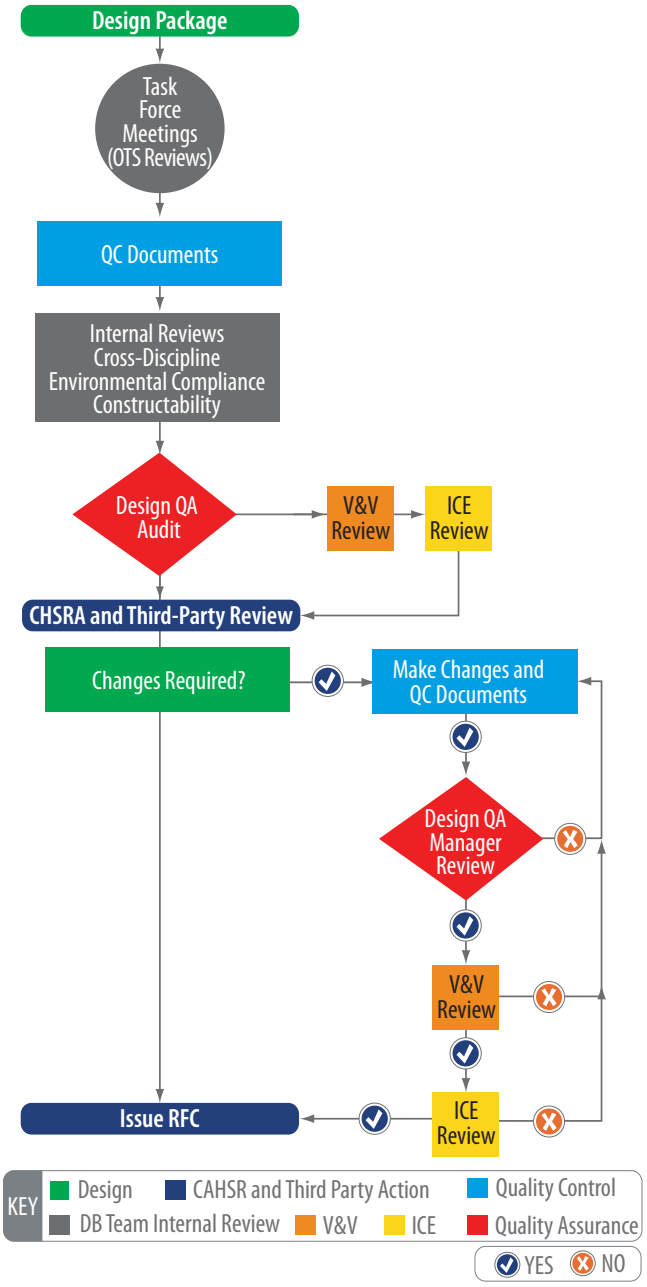
Every design submittal will be checked by the ICE. The ICE will carry out the independent design assessments and analytical design checks, which are described in section 5.7.

5.3.2. Design QA Process

The TPZP design QA will be performed on each design submittal before its submittal to the CHSRA. This review is an audit to confirm accuracy and conformance with the DQMP. If the submittal does not comply, a nonconformance notice will be issued. This QA audit will also be performed on all subcontractor submittals.

QA audits by the DQAM and the ICE will be performed with the submittal of each design package, including third-party submittals. This verification will be performed under the direction of the DQAM, Kevin Ma, in cooperation with the ICE and the V&V Manager. These audits will review the QC check prints and other quality records to ensure that the quality procedures are being correctly implemented and will be communicated and disseminated to the appropriate parties for formal disposition and required corrective actions. These audits will also provide confirmation that review comments are being correctly recorded, resolved, tracked, and verified. All review meetings will include comments for disposition developed by the ICE.

Figure 5-4: Quality Process for Design



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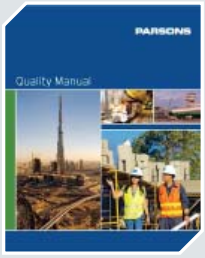


Parsons' quality manual standardizes our approach to quality project delivery. These quality requirements will be followed by the entire team, including all subconsultants, to ensure an entirely seamless quality-management system.

5.3.3. Construction QC Process

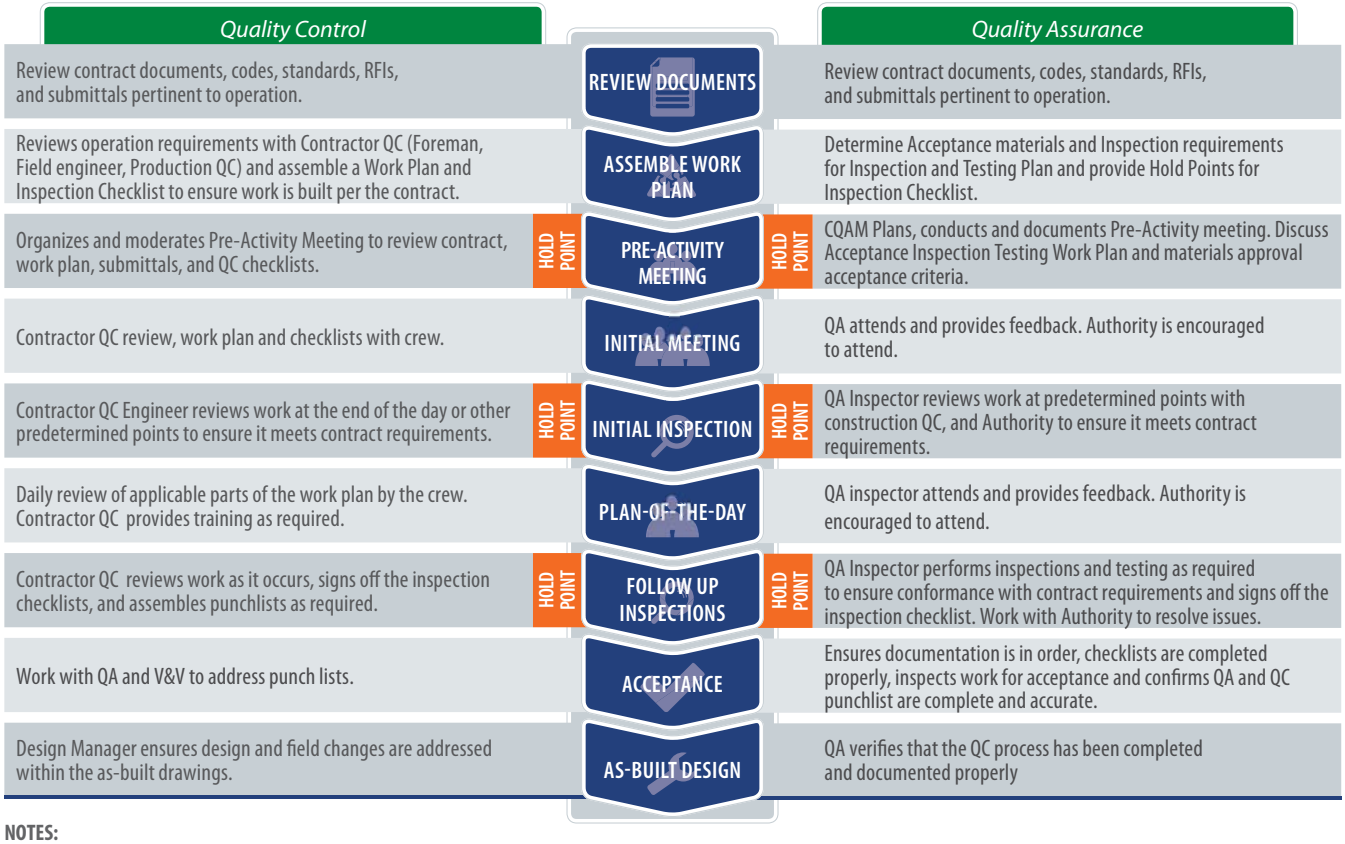
Our CQCM Manager, Jeffrey Payne, PE, will develop a project-specific CQMP, based on ISO 9001:2008 standards, in coordination with construction superintendents. Jeff will direct the construction QC process, as shown in Figure 5-5. Jeff will ensure that the operational techniques and activities performed meet the products or services requirements of the specifications. This includes but is not limited to taking measurements, testing, and inspecting a process or product to ensure that specifications are being followed. Jeff will be responsible for ensuring that the constructed work complies with the contract, and that all elements of the work are performed satisfactorily for the purpose(s) intended. All construction processes, procedures, and workmanship will be inspected by the TPZP QC group. Inspection observations, measurement, results, nonconformances, and corrective actions will be documented on forms acceptable to the CHSRA. Inspection observation and documentation will include a description of construction activity and location.

Our QC inspection staff will ensure that incoming material or equipment is not used in the work until it has been verified to be compliant through verified inspection or documentation. In-process inspection and testing will include the following:

- Inspection, testing, and identification of material, equipment, or elements of work, as required by the QMS
- Establishing conformance to specified requirements through the use of process monitoring and control methods
- Holding material, equipment, or elements of work until the necessary reports have been received and verified or until required inspection and tests have been completed
- Identifying nonconforming material, equipment, or elements of work

Final QC inspection will include the following:

Figure 5-5: Construction QA/QC Process



NOTES:
All hold points include V&V Manager and ICE/ISE

- Performing specified inspections and tests, including those required to be conducted either on receipt of materials or equipment or in-process, ensuring that they have been carried out, confirming that the data recorded meets specified requirements
- Performing all final inspections and testing in accordance with the quality plan and documented procedures to complete the evidence of conformance of the finished material, equipment, or element of work to the specified requirements
- Ensuring that no material, equipment, or element of work is accepted until all specified activities have been completed and the associated data and documentation is available

Our construction QC team will establish and maintain records that will provide evidence that each material, equipment, or element of work has passed inspection and testing.

The QMP will include procedures to identify products from applicable drawings, specifications, or other documents during all stages of production, delivery, and installation. Each item will have a unique identifier that will appear on all inspection, test, and fabrication records.

The CQCM has the ability and responsibility to effect changes in construction work in place where failure of compliance has been identified. The CQCM has the obligation and responsibility to issue nonconformance reports and deficiency reports, where appropriate, and retains the authority to issue stop-work orders, as needed.

Construction QC Inspection

TPZP will use full-time site-based QC inspectors (QCIs) and environmental team monitors to provide resources to comply with contract inspection and monitoring requirements. QCIs will have all required certifications and experience to verify compliance with contract requirements. Original design engineers will visit the site during construction on a regular and as-needed basis to ensure compliance with the intent of design. Environmental professionals will provide instruction and advice to QCIs regarding environmental monitoring.

All construction processes, procedures, and workmanship will be inspected by our QC group. Inspection observations, measurement, results, nonconformances, and corrective actions will be documented on approved forms. Inspection observation and documentation will include a description of construction activity and location by technical specifications section. There will be two types of QC inspection, in-process and final. They are defined as follows:

- In-process QC inspection includes inspecting, testing, and identifying material, equipment, or elements of work required by the CQMP and contract documents. In-process inspection will establish conformance

to specified requirements through the use of process monitoring and control methods. Materials, equipment, or work elements will be held until necessary reports have been received and verified or until required inspection and tests have been completed.

- Final QC inspection and testing will be performed as required by the CQMP to complete the evidence of conformance of finished material, equipment, or element of work. No material, equipment, or work element will be accepted until all QCP-required activities have been satisfactorily completed. Our quality group will maintain records for all material, equipment, and work elements that pass inspection and testing.

Our Quality Manager, Ben Fardi, or designee, along with a representative of the ISE will meet in the field with the supervisor of the work to verify conformance of the work to the requirements of the contract, applicable rules and regulations, and acceptance of inspection and test results, as well as the adequacy of the safety precautions taken, workmanship, etc. These inspections will be documented on inspection QC reports.

Construction QC Testing

TPZP will use a CHSRA-approved laboratory to provide resources to comply with contract testing. The QC testing laboratory will support testing needs for concrete cylinders, soil analysis, water quality, and other required testing. Additional staff for peak periods will also be available from the laboratory.

All tests will be done in accordance with contract requirements. Those tests that require certified technicians will only be performed by qualified individuals. The resources on hand ensure that such individuals will be available when needed.

The construction QC testing personnel will perform QC tests for construction processes, including, but not limited to, grading, bridges, walls, drainage, and paving. The QC testing will be performed at the frequency specified in the instructions to proposers (ITP). Routine laboratory and field tests for soils, concrete, and asphalt will be performed by or at the direction of construction QC testing personnel. A partial list of such tests may include the following:

Soils

- Sieve analysis/gradation
- Moisture content
- R-value
- Degradation of aggregate (LA Rattler)
- Proctor (maximum density)
- Compaction test
- Sand equivalent
- Cleanness value

Concrete

- Sieve analysis/gradation
- Sand equivalent
- Cleanness value
- Temperature
- Air entrainment
- Unit weight
- Slump test/Kelly Ball
- Compressive strength

Asphalts

- Sieve analysis/gradation
- Sand equivalent
- Cleanness value
- Temperature
- Air voids
- Oil content
- Proctor (maximum density)
- Compaction
- Asphalt viscosity

5.3.4. Construction QA Process

QA by TPZP includes all those planned and systematic actions necessary to provide the CHSRA confidence that the facility will perform satisfactorily in service. Within this broad context, QA involves continued evaluation of the activities of work planning, design, development of plans and specifications, construction, and the interactions of these activities.

Two principles guide the TPZP construction QA process: (1)"Fit for purpose," which means the product must be suitable for the intended purpose, and (2) "Right first time," which means mistakes should be eliminated. Our QA program includes managing the quality of raw materials, assemblies, products, and components, as well as services related to production, management, and inspection processes. TPZP CQAM Dennis Leahy will develop the QA work plan and direct all activities, including QA monitoring, inspection, testing, and documentation.

Our construction QA process requires that the procedures for incorporating design changes into the construction plans be well developed and fully utilized. The earlier that design changes are recognized and implemented, the lower the cost. Our QA efforts in construction will closely monitor how well the management of the design and change of design processes is functioning.

Another QA area that will be continuously monitored is the development of plans and specifications. Architectural and engineering plans and specifications often change during the construction phase of a complex project. It is important that the procedures for incorporating these changes into the construction plans be well developed and consistently followed.

In order to minimize construction costs while meeting all of the specifications in the plans and design requires that the advertising for bids and awarding of contracts be closely monitored. The qualifications of the contractors and subcontractors to perform the services advertised and meet the quality requirements will be examined carefully all during the construction phase of the project.

Finally, the actual construction activities will be closely monitored to ensure that appropriate construction materials are being installed and that the engineering plans and specifications are being met or exceeded throughout the construction process. The CQAM, the CQCM and the quality manager will meet regularly to ensure a quality project.

Construction QA Inspection and Testing

The QAI will perform surveillance of a representative sampling of QC and construction activities under the guidance of the CQAM, Dennis Leahy. At the direction of the CQAM, QA testers will take random samples and tests necessary to validate the QC test results on various materials in the laboratory or field, in accordance with applicable test standards and procedures. They will submit documentation to the CQAM.

The CQAM will audit the construction QC inspection program, including inspection documentation for adequacy and conformance to the CQMP and contract requirements as a basis for a monthly audit report. The report will also address the qualifications of the construction QCIs, the adequacy of staff for a specific construction operation, and the quality of the inspection and work being performed. On a random basis, the CQAM or his designee will audit specific construction QC inspection processes, including, but not limited to, grading, bridges, walls, guideway, drainage, and paving operations.

Construction materials will undergo a required material submittal process. Proper materials certifications, verifications, samples, materials testing, and inspections will be scheduled and coordinated through the QCIs. TPZP will use a CHSRA-approved laboratory to provide resources to comply with contract testing. The CQAM will audit the construction QC materials testing program, including documentation for adequacy and conformance to the ITP, CQMP, and contract requirements. The monthly audit report will document the findings. The report will address the correlation between the QA test results, the QC results, and the qualifications of the construction QC testing personnel.

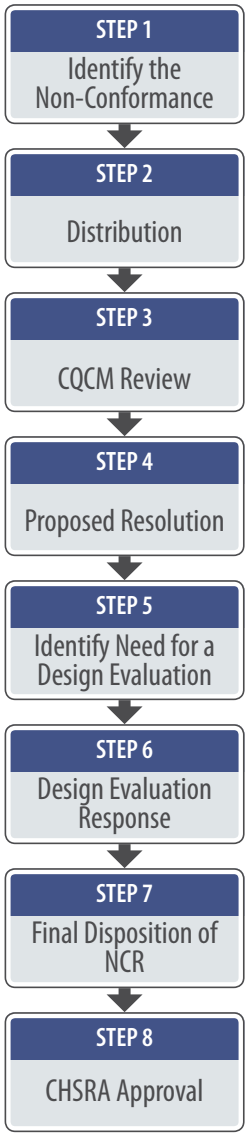
A schedule of audits, copies of audit reports, and corresponding corrective/preventive action plans will be submitted to the CHSRA.

5.3.5. Notice of Defect and Nonconformance

Defect and nonconformance reporting is a part of each quality management activity procedure and will be included on each checklist and/or custom report for that activity. Our CQCM, Jeffrey Payne, will be responsible for ensuring that construction-related nonconforming materials, equipment, or work is reviewed in accordance with our documented procedures. These procedures will ensure that material, equipment, or work that does not conform to specified requirements is prevented from inadvertent use or installation. The procedures will provide for identification, documentation, evaluation, segregation, and disposition of nonconforming materials, equipment, or work and for notification, as required. The QA manager will evaluate the severity of the nonconformance, as well as the likelihood of repeat occurrence, and with project management, field staff, and contractors, will formulate corrective and preventive action plans as warranted. The overall process to be used is shown in Figure 5-6.

Nonconforming materials, equipment, or work can become conforming by one of the following methods:

Figure 5-6: Nonconformance Resolution



- Reworked to meet the specified requirements
- Accepted with or without repair by the CHSRA
- Regraded for alternative applications
- Rejected or scrapped

The proposed use or repair of materials, equipment, or elements of work that do not conform to specified requirements will be reported to the CHSRA. If a concession is granted by the CHSRA, then the description of nonconformity that has been accepted and of the repairs made will be recorded to show the actual condition.

Repaired and reworked materials, equipment, or elements of work will be re-inspected in accordance with documented procedures.

These nonconformance elements will be tracked in a log by the CQCM. The log will include their disposition. This log will be reviewed with the CHSRA, the ICE, the ISE, our CQAM, our CQCM, our Design Manager and our Construction Manager at the weekly quality meeting. A corrective action schedule and action item list will provide meeting participants with a current disposition of non-conformances. As corrective actions are completed and quality groups concur that a nonconformance is corrected, the item will be removed from the list.

Our CQAM, Dennis Leahy, will be responsible for resolving construction-related nonconforming work, with assistance from the design and construction quality managers.

Our DQAM, Kevin Ma, will be the lead person to identify nonconformance elements in design. Such work will be documented through design audit findings, and subsequent corrective actions will also be recorded. These will be further subjected to follow-up audits. Likewise, identified nonconformance elements will be tracked to resolution for procured materials as well as constructed elements, as described above.

Our quality team will recommend to Ben Fardi, our Quality Manager, the ISE, and the CHSRA the proposed uses or repairs of material, equipment, or elements of work that do not conform to specified requirements. The decisions regarding the disposition will be made by the CHSRA upon the recommendations of the quality manager. If a concession is granted by the

CHSRA, then the description of nonconformity that has been accepted and/or repaired will be recorded to denote the as-built condition. The records of these will also be sent to the Document Control Manager as part of the permanent records of the project. Formal resolution of nonconformance and other quality issues will occur in the weekly quality meeting.

5.4. ENVIRONMENTAL COMPLIANCE QC/QA

5.4.1. Environmental Quality Management Plan

TPZP will implement a process and structure to meet or exceed compliance requirements of all environmental obligations for the project. The environmental quality management plan (EQMP) will be prepared and administered by the ECM, with support from the quality manager. It will be based on RFP Book 2, Part B, Section 42, Environmental Requirements, which provides general requirements to protect the environment. TPZP commits to fully comply with the Section 42 and federal, state, and local requirements as they apply to this project.

A draft EQMP will be submitted within 90 days of NTP, and a final plan will be submitted within 180 days of NTP or before any construction activities commence. Our design gives special consideration to the following:

- Special-status plant and wildlife species
- Potential archaeological and paleontological finds
- Hazardous waste sites along the alignment
- San Joaquin River crossing (adjacent riparian habitat, steelhead)
- Air quality as it relates to emissions from internal combustion engines
- Vibration disturbance to historic structures
- Noise during construction and from the trains
- Roadway access issues during construction
- Visual disturbance during construction

5.4.2. Inspection

TPZP environmental inspectors, with support from the construction staff, will provide environmental compliance as part of the QC organization. This leverages resources to provide greater project coverage. Site-based inspectors will have all required certifications and experience to address the types of work in progress at any given time. Environmental professionals will provide instruction to site-based inspectors performing daily monitoring tasks and will provide regular overviews of site-monitoring activities and responses to identified issues. The ECM, Macie Cleary, will report to the Quality Manager, Ben Fardi, and will coordinate environmental monitoring and inspections with the QCIs. A daily inspection report will be prepared and submitted to the CQCM for review and approval.

Environmental compliance procedures and checklists will be developed for each identified task and will be assigned to construction QCIs for daily items and to the ECM, Macie Cleary, for items requiring greater professional training to observe and monitor. Additional environmental experts are available to supplement project staff, where needed, on an on-call basis. All environmental compliance activities that need to continue after final acceptance will be prepared and submitted before contract closeout.

5.4.3. Monitoring and Testing

TPZP will provide environmental compliance monitors during project construction. These will include, but not be limited to, wildlife and fish biologists, noise/vibration specialists, water quality monitors, archaeologists, paleontologists, and historic resource monitors. These individuals report to the ECM and work closely with CQCM staff.

The ECM and staff are authorized to issue stop-work orders in the event that activities on sites have caused or are likely to cause significant adverse environmental effects. In this case, the ECM, Macie Cleary, or the environmental monitor/inspector would notify the CQCM in writing that a stop-work order has been issued, why it has been issued, and what measures must be achieved in order to resume work. Any work that is stopped due to environmental cause cannot resume until the deficiency is corrected, tested, and verified. The stop-work order and the associated corrective action will be maintained as project quality records.

5.4.4. Hazardous Materials Management

The EQMP will also include a hazardous materials handling and storage plan to address the management of all hazardous materials, including potentially contaminated materials generated during the course of constructing the CAHSR CP1 project. The plan will ensure that all material safety data sheets are made available to the CHSRA and to the construction team. A list of waste categories requiring planning includes contaminated and hazardous soils and ballast; contaminated groundwater; hazardous material in demolition facilities, including asbestos, underground storage tanks (USTs), and lead-based paint in structures targeted for demolition; and impacts to surface waters. Potential impacts and corresponding procedures and mitigation measures are usually detailed within the project environmental impacts mitigation plan for hazardous materials. Contaminated material management protocols are usually identified in collaboration with the lead regulatory agency, the California Environmental Protection Agency - Department of Toxic Substances Controls (CALEPA/DTSC). The following is a description of the materials outlined above:

- ***Impacts due to ballast and soil contamination:*** Contaminated soil and ballast along the alignment presents the potential for impacts during construction in terms of the possible exposure of construction workers, the community, and/or the environment to hazardous material through improper handling, stockpiling, reuse (or disposal),

and/or transportation of the soil and ballast. Our experience with similar projects indicates that relatively high concentrations of arsenic and lead may be encountered in shallow soils and ballast throughout the former railroad right-of-way. Other commonly encountered contaminated soils are usually associated with historical petroleum hydrocarbon leaks and spills and occasionally with pesticides/herbicides, volatile organic compounds (VOCs), or polychlorinated biphenyls (PCBs). The results of the Phase II report will be used to plan, permit, and coordinate impacted soil/ballast management requirements for the entire project in advance of construction activities.

- ***Impacts due to groundwater contamination:*** Depth to groundwater in the various basins along the alignment varies from less than a foot to 500 feet, with Merced County groundwater within 10 feet of the ground surface. Contaminated groundwater may be encountered during the construction of retained cuts, depressed roadways, and structures, such as culverts and foundations for aerial structures and bridges. Advanced planning for the handling of potential groundwater contamination and permitting the wastewater disposal requirements will be necessary to prevent project delays.
- I***mpacts due to building demolition:*** Portions of the alignment will require the demolition of existing buildings. Hazardous materials, such as asbestos or lead-based paint, may be present. Parsons will utilize the services of a certified asbestos consultant (CAC) to survey facilities targeted for demolition to assess the presence, or lack thereof, of hazardous materials.
- ***Impacts due to surface water:*** Surface water contamination during construction may result from contact surface water, such as rainwater runoff, and from hazardous materials. The hazardous materials may include existing contaminated soil, spills of hazardous materials used in construction, or spills of untreated contaminated groundwater generated during dewatering. Surface waters will be managed as required by federal, state, and local regulations.

TPZP will prepare a hazardous waste operations and emergency response plan (HAZWOPER plan) for the control of hazardous substances, in compliance with California Code of Regulations, Title 8, Section 5192. The HAZWOPER plan will be kept on-site, available to all employees, authorized visitors, and the CHSRA upon request. The HAZWOPER plan will include information for emergencies, such as injury to an employee or member of the public; fire; flood; earthquake; property damage and damage to various utilities, such as electrical, gas, sewage, water, telephone, or public roadways; public demonstrations; acts of sabotage, including threats of sabotage; hazardous materials encountered; toxic spills; explosions; vehicular accidents; and confined space rescues. At a minimum, the HAZWOPER plan will include the following:

- Identification of the person responsible for handling an emergency
- Establishment of teams for handling each type of emergency
- Identification of the person responsible for making the emergency call (preferably the ranking supervisor present)
- The requirement to conspicuously post a list of emergency phone numbers, along with information to be transmitted in an emergency, including emergency phone numbers and the number of the CHSRA representative to be contacted (request telephone number and name of CHSRA contact person or persons from the CHSRA representative)
- Site identification and signage for emergency responders
- Trench and confined-space rescue plan or tunnel evacuation plan, as applicable
- The procedure for contacting the CHSRA representative when an incident of emergency response occurs
- Scene management for the emergency response, including procedures for ensuring the safety of employees and emergency responders, safeguarding the scene from unwanted entry, and handling on-scene media

Certifications and Approvals

The ECM, Macie Cleary, will be responsible for obtaining all required environmental permits, licenses, and approvals. Required approvals and permits are identified in approach for obtaining ICE environmental approvals/permits (RFP Book 3, Part D.3). Critical approvals and permits include, but are not limited to, the following:

SJVAPCD CONSTRUCTION PERMITS	
Rule 2010 General Permit Requirements	Rule 4601 Architectural Coatings Requirements
Rule 8011-thru 8071 Fugitive Dust Requirements	Rule 7050 Asbestos Requirements
USFWS/NMFS	
Section 7 Biological Opinion	
SJVAPCD CONSTRUCTION PERMITS	
Section 401 State Water Quality Certification	Section 402 Municipal Separate Storm Sewer Systems Permit (MS4)
Section 402 NPDES Permit	Section 404 Dredge and Fill Permit
CALIFORNIA DEPARTMENT OF FISH AND GAME	
Section 1602 Streambed Alteration Agreement	Section 2081 Incidental Take Permit
CALTRANS	
Right-of-Way Encroachment Permits	
STATE LANDS COMMISSION	
Long-Term Lease for San Joaquin River Crossing	
CALIFORNIA PUBLIC UTILITIES COMMISSION	
Approvals/Permits per General Order No. 95 – Overhead Electric Line Construction (includes catenary construction and location power systems)	Approval for closure of existing or construction of new railroad grade crossings

5.5. COORDINATION REQUIRED TO ENSURE QUALITY

As shown in Figure 5-2, we will create a separate quality function, independent of design and construction production, reporting directly to Steve Pavoggi, the TPZP Officer-in-Charge. The quality manager will be responsible for the quality function and will be the CHSRA's primary point of contact for quality issues. TPZP will keep the CHSRA informed of quality management issues, including instances of nonconformance, and will provide the CHSRA access to quality management records. The quality manager will cooperate and coordinate with the CHSRA to fulfill these requirements.

The coordination between functional disciplines for safety, quality, V&V, design, construction, and environmental are essential to project success. Coordination occurs through reviews, regular task-force meetings, and daily informal interaction among TPZP team members and CHSRA representatives. Detailed meeting notes will document collaboration and decision making. It is also understood that the CHSRA may conduct independent testing or statistical sampling of the work and may audit the TPZP team at any time.

> As a value-added benefit, TPZP will engage a quality task force to review and resolve design and construction submittal issues promptly and in a team atmosphere.

A well-planned and implemented review process is essential to project performance and will be instituted to include a value-added project quality task force. The task force will include the quality manager, all QA and QC managers, the project manager/director, the design manager, the construction manager, the V&V manager, the ICE/ISE manager, the officer-in-charge, and a CHSRA representative. The task force will meet before each submittal to the CHSRA. Reviews will be formally structured and documented, and will allow a smooth transition to the next project phase. A comment form, disposition, and implementation procedure will be used, clearly defined to allow reviewers to easily determine the action required and taken. The submittals and review periods have been identified in the RFP. These durations have been built into our team's design and construction schedule. We are solely responsible for the technical content, constructability, and conformance to contract requirements. Reviews by the CHSRA and other stakeholders will not relieve this accountability.

5.6. THIRD-PARTY QUALITY COORDINATION

TPZP is committed to addressing the concerns of the community and local third-party stakeholders while honoring the commitments reflected in the contract documents. Through our extensive design-build experience, we have learned that when it comes to stakeholder and community outreach, one overriding rule exists: communicate accurate information as early and as frequently as possible.

The project's success requires TPZP to work closely with a wide variety of stakeholders and third parties, included in Table 5-2.

To facilitate coordination with the listed stakeholders, we will develop a project coordination matrix that identifies responsible people for each entity. We will maintain single points of contact with each stakeholder to ensure timely and consistent messages and to develop effective design solutions proactively.

> TPZP will ensure that third-party work is in compliance with the CHSRA's contract.

TPZP will ensure that third-party work performed for this project is planned, executed, monitored, controlled and is in compliance with the CHSRA's technical contract requirements. TPZP will use its V&V/self-certification procedures (see section 5.7) to demonstrate compliance with requirements, including inspections, testing, and formal acceptance of the work. TPZP will follow all third-party entity requirements, policies, codes, standards, processes, and delivery methods, as applicable, to incorporate third-party project work into the overall design and construction for the project.

TPZP will also coordinate with other design and construction teams performing work under separate contracts adjacent to or near this project. See Section 2.1. for a more complete description of TPZP's third-party coordination process. The TPZP team has proven experience in conducting third-party coordination, as demonstrated by the following examples:

- The Tutor Perini/Parsons team successfully satisfied all third-party commitments, including approximately 1,000 utility conflicts, five jurisdictions, and two operating railroads on the $783 million Alameda Corridor Mid-Corridor Trench project.
- On the I-25 T-REX design-build, Parsons, as part of a joint venture, developed an innovative partnering process between the Regional Transportation District (RTD), the Colorado Department of Transportation (CDOT), and numerous third parties, which allowed delivery of this $1.3 billion project **21 months ahead of schedule.**
- As program manager on the $1.25 billion TRIP/Bakersfield Program, Parsons provided third-party quality coordination with the same major utilities, railroads, and Caltrans.
- Zachry has an extensive history of successfully managing projects with the highest level of quality, including the $972 million TxDOT SH 130 Segments 5 & 6 project and the $967 million TxDOT DFW Connector.

Table 5-2: Stakeholders and Third Parties

Local Agencies and Jurisdictions	
Caltrans, District 6	Fresno Department of Public Works
City of Fresno	Fresno Metropolitan Flood Control District
Fresno-Clovis Wastewater Treatment and Reclamation Facility	Madera County, County of Madera
Fresno County	Madera Wastewater Treatment Facility
Fresno County Landmarks and Records Advisory Commission	City of Madera Sewer Division
Fresno Irrigation District	Madera Irrigation District

Resource Agencies	
California High-Speed Rail Authority	San Joaquin Valley Air Pollution Control District
Bay Area Air Quality Management District	State Historic Preservation Office
California Air Resources Board	State Water Resources Control Board
California Department of Fish and Game	U.S. Fish and Wildlife Service
California State Lands Commission	California Public Utilities Commission
National Marine Fisheries Service	Regional Water Quality Control Board (Central Valley Region)

Utility Companies	
AT&T	Kinder Morgan Petroleum
Pacific Gas and Electric Company	Sprint-Nextel
Comcast	Verizon
Level 3	tw telecom

Federal Oversight	
Advisory Council on Historic Preservation	U.S. Army Corps of Engineers
Federal Railroad Administration	U.S. Environmental Protection Agency

Railroads	
Union Pacific Railroad	BNSF Railway
San Joaquin Valley Railroad	

5.7. APPROACH TO VERIFICATION AND VALIDATION

TPZP's approach to V&V follows the traditional "V" systems engineering model and starts with the definition of project technical requirements before design choices are made and the project is implemented. This approach is based on three important elements: people, tools, and processes.

5.7.1. V&V Organization

As shown in Figure 5-2, TPZP's verification and validation group will be part of our quality group and will consist of internal resources (V&V manager, requirements lead, configuration lead, testing staff, integration staff, and design leads), independent contracted resources (independent checking engineer and independent site engineer), and CHSRA resources. Early coordination with the various stakeholders in the final certification of the project is emphasized.

TPZP's V&V Manager will be Alain Kouassi. Alain is a senior systems integrator with Parsons, who has more than 22 years in key interdisciplinary roles on major projects, including tunnel systems; civil infrastructure; structural elements, such as bridges and track structures; utilities; and mechanical and electrical systems. Alain has provided systems engineering and integration management on highly integrated, high-capacity, complex projects, including the $8.3 billion East Side Access project in New York City and the $868 million Mid-City Exposition Light Rail Transit design-build project in Los Angeles.

Alain's experience includes developing and managing V&V processes, including system architecture development, requirement management, design coordination, interface management, configuration management, testing and commissioning, and safety certification. Alain is well known in the systems engineering community, having published and presented at several conferences internationally and having led the infrastructure working group that he chairs for the International Council on Systems Engineering (INCOSE) in the development and publication of a ***Guide for the Application of Systems Engineering in Large Infrastructure Projects***.

5.7.2. V&V Tools

TPZP will use the following tools to make the process more visible and to generate monthly reports that we will be submitting to the CHSRA:

- IBM Rational DOORS for requirements management, change management, interface management, and certifiable items list management. This tool will be a repository for source and target traceability documents, interface descriptions, interface types (technical, internal, external), status history/last updates, documentation and testing references (to identify testing requirements), and links to safety and security certification items and certifiable element lists (CELs).

- A custom-designed test tracking tool to serve as a repository to track, manage, and document the comprehensive testing of project elements.
- Requirements traceability matrix (RTM), an output of DOORS, to be used at contract initiation for requirements baseline establishment; during design, including at key design milestones; during construction; testing; and self-certification.
- CELs, which will be managed in DOORS.

Task Force Topics

The concepts discussed in ParSEM have been successfully implemented on previous projects with extensive civil and structural components.

TPZP will use several systems engineering process activities, as well as several systems engineering support functions, during our V&V efforts. We will start with IEEE1220 and the international standard IEC15288 and their general provisions and will establish a tailored approach that fits our project, including its major civil and structural elements. We will then apply our systems engineering best practices manual (ParSEM), developed by Parsons, an industry leader in systems design and integration with extensive knowledge in V&V. Parsons will use its proven and time-tested systems engineering approach to manage the development of a V&V plan to produce a quality product that meets or exceeds contract requirements.

5.7.3. Verification and Validation Plan (VVP) Outline

Verification and Validation Process

V&V aims to provide evidence that the project meets its specified requirements in all respects. Verification confirms that the infrastructure is properly designed and built by TPZP, and validation is a check to ensure that the right infrastructure and subsystem elements have been constructed.

TPZP's V&V process starts with the establishment of a process to record the evidence necessary to demonstrate that TPZP releases designs that are compliant with the technical requirements and that the implemented infrastructure is compliant with TPZP's design. See Figure 5-7.

Verification: For TPZP, the purpose of our verification process is to confirm that the design requirements specified by the project are fulfilled. We will ensure that the infrastructure, its elements, and its interfaces conform to their requirements.

To accomplish this, TPZP will plan verification by scheduling, confirming, and installing verification enabling systems and will perform verification by developing verification procedures, by conducting verification activities per established procedures developed by our V&V manager to demonstrate compliance with the requirements, and by documenting verification results and entering data into the RTM.

> TPZP's priority is quality, and we have committed resources to deliver a superior quality product. This will be documented with a thorough program of self-certification, verification, validation and independent review.

Validation: For TPZP, the purpose of our validation process is to provide an objective evidence that the services provided by the infrastructure, when in use, comply with the stakeholders' requirements, achieving its intended use in its intended operational environment. We will ensure that the requirements and the system implementation provide the right solutions to the project's problems (i.e., that we built the right infrastructure).

To accomplish this, TPZP will perform validation by developing validation procedures, ensuring readiness to conduct validation, conducting validation to demonstrate conformance to stakeholder requirements, analyzing anomalies for corrective actions, recommending corrective actions and obtaining stakeholder acceptance of validation results, documenting validation results, and entering data into the RTM.

Validation will occur throughout the V&V life cycle and will be performed on an ongoing basis.

Verification and Validation Plan: TPZP's V&V plan will describe the global objectives of V&V; discuss the V&V strategy and process (i.e., steps that allow reaching these objectives); and present the verification, validation, and certification activities to be carried out by TPZP to meet the requirements of the project. The plan will also include the organization and parties in charge of V&V and the methods and tools utilized to execute V&V.

Alain Kouassi led the development of this IBM Rational DOORS Requirements Traceability Matrix for the TTC Transit City System Design Services project in Toronto.

ID	RqmtM Plan	Discipl
RQMT.1	**1 Purpose and Scope**	TOC
RQMT.2	1.1 Purpose	TOC
RQMT.3	The goal of requirements management is to specify the Transit City (TC) Systems which, when built provide value to all stakeholders (system users/maintainers, passengers, and the transit authority).	RM
RQMT.4	Effective requirements definition and management enables the TC Project's systems design consultant (the URS Parsons Joint Venture (UPJV)) to determine the correct mix of product capabilities and characteristics that will best deliver this value.	RM
RQMT.5	The purpose of this Requirements Management Plan (RqmtMP) is to provide the guidance for establishing and maintaining the integrity of the requirements for the Transit City (TC) Systems project.	RM

The V&V plan will include the following:

- The deliverables for each phase of the contract (design, construction, and testing/acceptance) and the activities for each deliverable
- The responsibility assignment matrix for deliverables and activities, including stakeholder coordination
- The outputs per phase (design, construction, testing), including the RTM and the metrics used to measure and report progress.

TPZP will use techniques such as design development and design analysis, traceability analysis, and reviews appropriate to the current level of design. Traceability will be used to verify that requirements fully satisfy their parent requirements. Document reviews will be carried out by the relevant stakeholders to validate the requirements. See Figure 5-8.

Requirements Management: At NTP, TPZP will develop and implement a requirements management process to identify, define, assign attributes, analyze, derive, trace, manage, and document the contract technical requirements. The process will include the use of the IBM Rational DOORS requirements management tool. The process for verifying requirements at all phases of the contract will also be discussed. Requirements change management, including the process of verifying changed requirements, as well as validating changed requirements, will also be discussed.

Design Coordination and Interface Management: To achieve the integration of the CAHSR CP1 project's elements, including systems, civil, architectural, facilities, guideway, trackwork, utilities, etc., TPZP will identify, track, mitigate, and document all relevant interfaces in a DOORS module. All interface and integration will be documented in the interface management plan (IMP). The draft IMP will be submitted 60 days after NTP, and the final IMP 90 days after NTP.

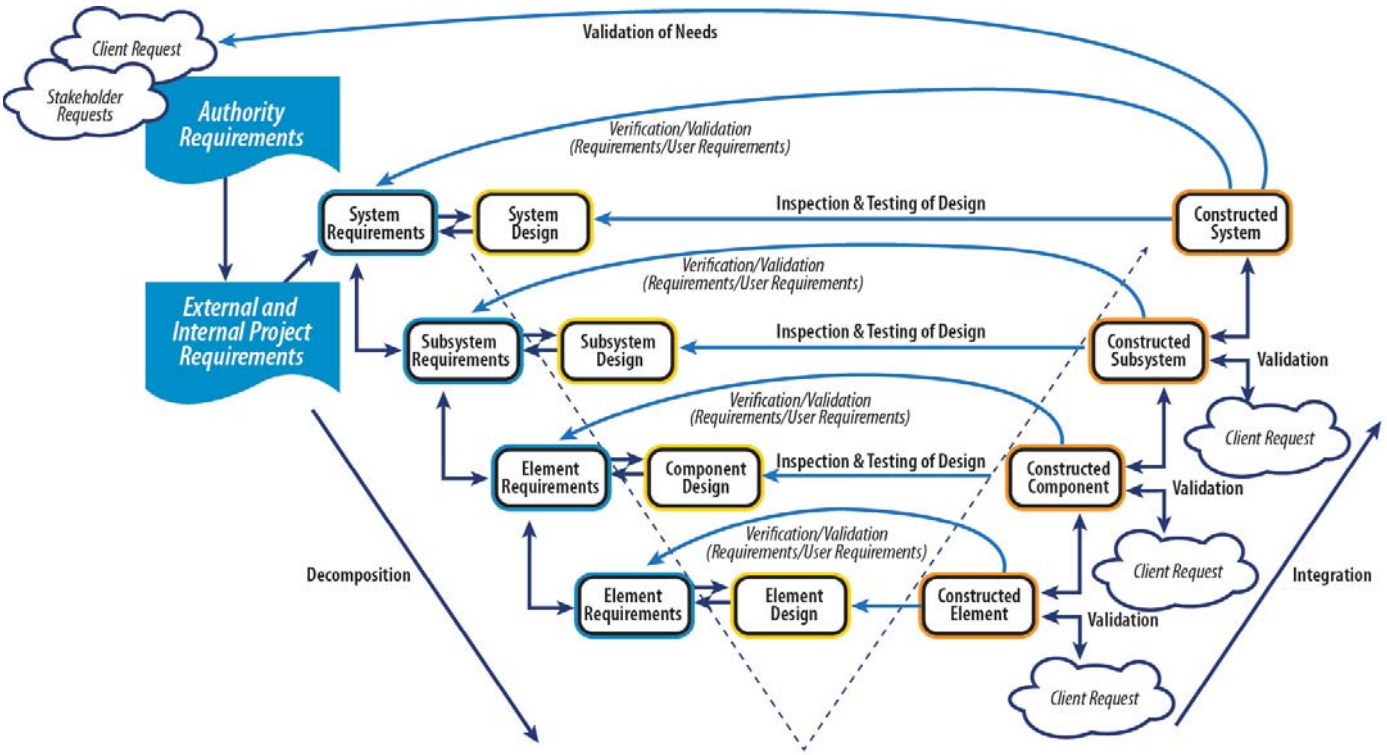
The IMP will describe how the interfaces between project elements will be identified, managed, tracked in DOORS, and documented and how they will be coordinated and checked during the design and construction phases of the project.

Change Management of Design and Construction: TPZP understands that because of the duration of the project and potential changes to safety legislation and environmental compliance requirements, planning and managing changes in the technical requirements is necessary.

TPZP will start with a design, but changes will inevitably be required due to constructability, efficiency, fit, unforeseen circumstances, or changes in the requirements. We will use IEC 10007 and its general practices to control configuration of the design, construction, and testing phases. This will allow design documents to be updated to reflect the as-built drawings after construction completes. TPZP's change management process will have the following characteristics:

- A set of documented processes for configuration identification, control, status accounting, and audit. We will not use ad hoc methods.
- A clear identification and approval from the CHSRA on the items and documentation that are required to be maintained under configuration control.

Figure 5-7: Verification and Validation Process



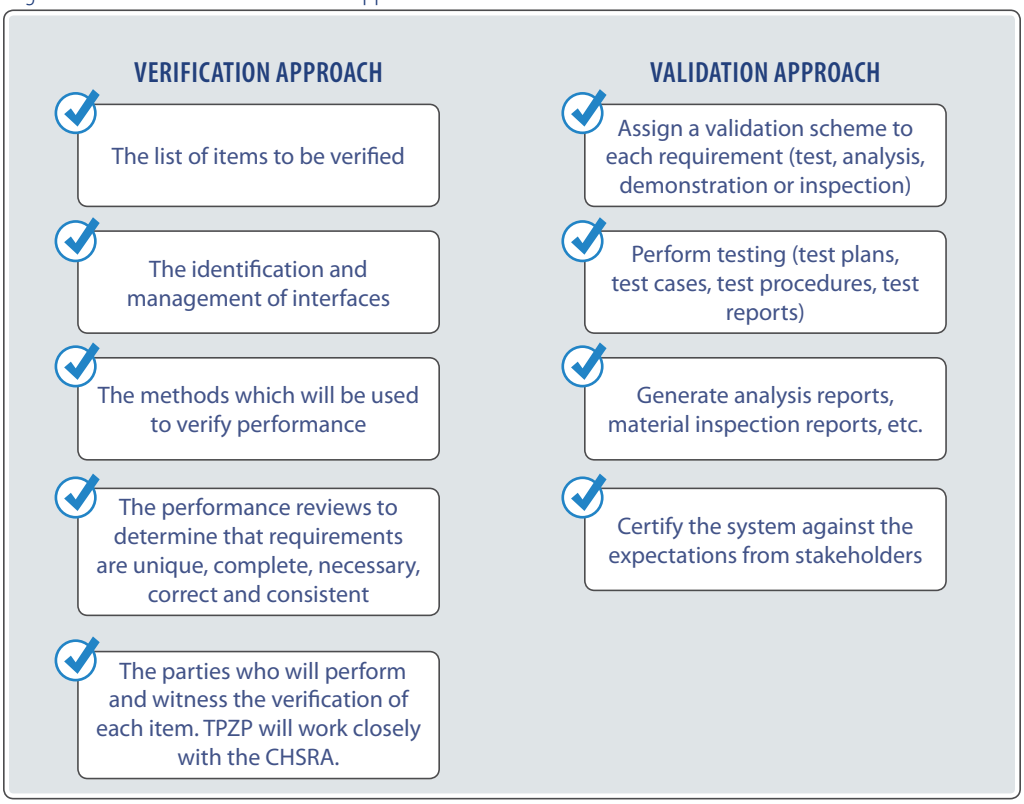
- A clear establishment of approval authorities and identification and recording of construction evidence required to document as-built conditions.

ICE/ISE Activities – TPZP has selected STV, Inc., to serve as its ICE/ISE. STV, Inc., has extensive transit design-build experience, FTA program management oversight (PMO) experience and is knowledgeable of Caltrans ICE/ISE requirements.

For 25 years, STV, Inc., has worked with the FTA on consecutive PMO contracts and has established a reputation for consistent, high-quality work. Relevant example projects include the following:

- $2.2 billion Bay Area Rapid Transit District (BART) Capital Projects
- $2.0 billion Denver Regional Transportation District (RTD) LRT program
- $2.5 billion Seattle Sound Transit Link/Sounder Capital Programs

Figure 5-8: Verification and Validation Approach



STV, Inc.'s, involvement in major projects in the last five years similar to the CAHSR CP1 project includes the following:

- $32.8 million California HSR Los Angeles-to-Anaheim EIR/EIS
- $360 million SMART Initial Operating Segment
- $1.1 billion Charlotte Area Transit System LYNX Blue Line Extension
- $320 million MBTA Greenbush Line Rail Restoration

Recent projects demonstrate STV, Inc.'s, design and construction experience in similar conditions, including geotechnical earthquake engineering analysis and design (CAHSR EIS/EIR and SMART), and seismic design for viaducts and bridges (SMART and MBTA). STV also has relevant experience in deep foundations and earthwork design in soft ground, having done similar work for the Dallas Area Rapid Transit (DART) $2.8 billion light rail transit expansion, the $8.3 billion MTA East Side Access project, and the $3.2 billion Port Authority of New York and New Jersey (PANYNJ) World Trade Center Transportation Hub project.

STV, Inc., has direct experience in the role of independent V&V, including the following:

- $2.8 billion DART LRT Extensions Project Management
- $2.2 billion FTA BART PMO Capital Projects
- $6.2 billion Virginia Department of Rail–Rail to Dulles Airport
- $450 million Houston Metrorail Project Management

STV, Inc., has a staff of 1,600 throughout North America and 100 in California. The staff proposed are all professional engineers, licensed by the state of California. STV, Inc., staff will be located next to the project office in Fresno, to ensure easy access to CHSRA and TPZP staff.

ICE/ISE – STV

With 40 years of experience, STV, Inc., has earned a national reputation as a leader in the transportation and infrastructure industries by providing high-quality service; an integrated, multidisciplinary approach; exceptional project experience; an ISO 9001-compliant QA/QC system; and veteran project managers and principals—many of whom are former managers of passenger rail agencies.

Anthony Venturato, with STV, Inc., will serve as project ICE/ISE Manager. Anthony is a vice president and program manager with 40 years of experience in transportation projects, including several transit systems: $2.8 billion DART Design-Build, $450 million Houston Metro LRT Phase I, and the $300 million St. Clair County, Illinois, Metrolink LRT extension, where he has had responsible charge for design, construction and system start up. Anthony also brings his experience as the FTA project management

oversight manager for the $1.5 billion BART SFO project, and the Engineering Manager for the CHSRA Los Angeles to Anaheim EIR/EIS project.

The ICE/ISE will perform independent V&V for the duration of the contract. Every contract submittal will be fully checked by the ICE during final design and the ISE during construction before submittal to the CHSRA. The ICE/ISE will be an independent arm of the CHSRA, and at the same time, will fully coordinate its reviews with TPZP's QA/QC and V&V review process.

The ICE/ISE project management and staff report to the TPZP officer-in-charge and the CHSRA, as shown on Figure 5-2. They do not report to TPZP design and construction production staff. This ensures the ICE/ISE's independent role to assess and evaluate all TPZP submittals to certify that all design and construction meets contract requirements. In addition, the ICE/ISE will warrant such certification to TPZP and to the CHSRA' representative.

Before any TPZP contract submittal, Anthony and his ICE/ISE team will assess and evaluate the following:

- Contract management submittals
- Design submittals and changes
- Construction submittals
- As-built documents

The ICE/ISE will be an active participant with, but will be independent from, TPZP to coordinate, review, and certify the design and construction submittals, including those from contracted third parties, through an evaluation based on accuracy, adequacy, conformance to standards and practice, compliance with codes and standards, cost effectiveness, quality, and fitness for purpose and/or function, as specified in the contract.

During the design, the ICE will perform an independent analytical check to establish the structural adequacy and integrity of structural members without reference to TPZP's calculations. The calculations will include structural geometry and modeling, material properties, member/section properties, loading intensities, and structural boundary conditions. The ICE will sign and seal all independent structural calculations.

During construction, the ISE will observe construction activity and attend all construction witness and hold meetings; take random samples of materials and installations; obtain results from an independent test lab and compare results with the TPZP's test reports; and conduct repeat testing when any discrepancies outside of pre-established, reasonable tolerances occur.

Self-certification of the project elements will occur, with the ICE/ISE performing a full compliance check against the technical contract requirements of all TPZP draft V&V submittals. Any discrepancies will be rectified by TPZP and approved by the ICE/ISE for technical adequacy and compliance with contractual terms, in accordance with the approved V&V plan, before formal submittal to the CHSRA.

Life Cycle Verification and Validation Activities

NTP: After NTP, we will build an RTM from the source technical documents provided by the CHSRA, in which each requirement will have a verification activity associated with it. In this matrix, a unique requirements identifier will be used for traceability to test plans, procedures, and reports and to provide a closed-loop verification process from demonstrated design artifacts to the requirement. TPZP will work closely with the CHSRA to ensure that the requirements are elicited, analyzed, validated, documented, and baselined early. The main objective is to develop a validated set of project technical requirements that meet stakeholders' needs. The process that TPZP will use includes requirements elicitation; requirements analyses, documentation and validation; and managing these requirements. Outputs to be produced at this stage and to be submitted for review and approval include a system acceptance document, a system V&V plan, and an RTM.

Design Phase: During the design phase, TPZP will produce high-level and detailed designs that meet the system requirements; that define key interfaces; and that facilitate the development, integration, and future maintenance and upgrades of the overall high-speed train system. The process that TPZP will use includes: developing and evaluating alternative high-level designs, documenting interfaces and identifying standards; and developing detailed component-level design specifications.

Formal V&V activities will be undertaken during design review activities. Traceability will be used to verify that requirements fully satisfy their parent requirements. As V&V information is collected, it will be used to build and update the traceability structures in the requirements database. Output reports from the requirements database will be provided in the RTM. Document reviews will be carried out by the relevant stakeholders to verify and validate the requirements.

Design Verification and Validation: Design V&V and self-certification will be executed through formal review and approval processes. Each design package will undergo a thorough verification, validation, and certification for design criteria compliance, specification compliance, contract compliance, and constructability compliance. Design team members carry out design verification throughout the QC checking and the formal design review processes to ensure that design output meets design input requirements, thus ensuring that specified requirements in the contract are being fulfilled. Design verification is accomplished when the independent checker of structural calculations performs alternate calculations that are then compared with the designer's calculations. Upon final review comment disposition, all final design packages will require formal certification from the designer of record, including formal approvals from the CHSRA, appropriate agencies, and authorities having jurisdiction. The RTM will be used as a tool to facilitate design V&V activities.

Design Validation: Validation of design is an ongoing process at different stages of design, aimed at ensuring that the requirements for design's intended application are continuously fulfilled. The design will be

validated through technical coordination, interdisciplinary reviews, and constructability reviews. These reviews address technical issues, interface and integration issues, and constructability issues. All design packages prepared and submitted to the CHSRA will be 100 percent checked and reviewed and will have undergone a design quality audit before being certified and submitted for acceptance. All validation documents will be maintained as quality records.

Design Change Management: Written requests for design changes may originate from a CHSRA representative, internal or external design organizations, field personnel, or regulatory or government bodies. Field communications in the form of requests for information (RFI) or field change requests (FCRs) to the designers will come through the construction manager and design manager.

When the CHSRA directs a change in the scope of the work defined in the contract, a change order document is prepared. Changes to the technical requirements will be added to and managed in DOORS. Changes to drawings or specifications already issued for construction, when re-issued, are noted as revisions on the altered document. The design manager will work with the V&V manager to ensure that the revised document is traced to the RTM and undergoes design QC processing, the same as the original design.

Once approved by CHSRA, the changes are provided to all holders of affected documents. A log of approved design changes will be maintained in DOORS.

During the last 12 years, Parsons and STV, Inc., have worked with the CHSRA as a regional consultant for EIR/EIS segments.

Construction Phase: During the construction phase, TPZP will verify that the infrastructure is constructed in accordance with the high-level design, requirements, and verifications plans and procedures; will confirm that all interfaces have been correctly implemented; and will confirm that all requirements and constraints have been satisfied. During this phase, TPZP will add detail to integration and verification plans, establish the integration and verification environment, perform integration, and perform verification. Outputs expected from this phase include the integration plan (updated), the verification plan (updated), the integration test and analysis results, and the verification results, including corrective actions taken.

To perform verification during the construction phase, TPZP will ensure that every requirement is verified using the test cases defined in the verification procedures. These will be part of the four basic techniques that are used to verify each requirement: testing, demonstration, inspection, and analysis.

Construction Verification and Validation: Construction V&V and self-certification will be executed through formal review processes, material submittal processes, approval processes, preparatory meetings, initial inspections, hold point inspections, testing, surveillance, witnessing, work-in-place inspections, and audits. Before construction, all proposed construction materials will be formally submitted, reviewed, and approved before incorporation into the project. Material approvals will be verified, validated, and certified, as identified within the V&V plan. Material suppliers, vendors, and fabricators will undergo on-site inspections, required for concurrence of project verification, validation, and self-certification measures. Approved material certifications will be required before incorporating permanent construction materials into the work in place. Field-level testing will be executed as scheduled/required, with test results properly documented and reported in accordance with the V&V plan.

Completed construction scope(s) will be verified, validated, and self-certified for compliance with issued-for-construction design plans/drawings, specifications, and contract requirements. Formal verification, validation, and self-certification will consist of, but will not be limited to, initial inspections, hold point inspections, work progress inspections, material testing, and final inspections. All inspections and testing will be formally documented and reported in accordance with the V&V plan.

Construction Validation: Construction validation will be performed after the infrastructure has passed verification and is installed. The objective is to confirm that the installed infrastructure meets the users' needs (end users and their proxies) and is effective in meeting its intended purpose. TPZP will update the validation plan as necessary and will develop procedures, validate the infrastructure, and document validation results (including documenting issues/shortcomings), including any recommendations or corrective actions.

Construction Change Management: As the design has been verified, validated, and self-certified, changes during construction are expected to be minimal. However, when changes do occur, they will be documented through the same change management process discussed for the design phase. Field communications, in the form of RFI or field change requests (FCRs), to the designers will come through the construction manager and design manager. These RFI and FCRs will be documented in the RTM in order to ensure resolution, proper traceability, and proper documentation.

5.7.4. Prior Experience with the Verification, Validation, and Self-Certification Process

The TPZP team has verification, validation, and self-certification experience relevant to the CAHSR CP1 project.

Tutor Perini employs a stringent process for QA and QC on all projects, including project verification measures, project validation measures, and project self-certification measures. This process is made up of four parts: a quality program plan, a design QC plan, a construction QC plan, and a QA plan. The process is reviewed annually. QC compliance reviews are

conducted quarterly, and quality audits occur monthly or more often as necessary. In addition, Tutor Perini requires all personnel to attend quality orientation workshops and provides continuing education in all aspects of the quality management process. Subcontractors and subconsultants are also required to have a quality plan that meets these criteria or to follow the plan established by the joint venture.

Proven V&V and Self-Certification Process

TPZP's V&V and self-certification process has been successfully implemented in California on such design-build projects as the $609 million BART SFO Extension.

The BART SFO Extension, for example, was led by an International Register of Certified Auditors (IRCA)-accredited ISO 9000:2000 lead auditor employed by Tutor Perini. This manager of QA/QC was responsible for managing, developing, implementing, and maintaining a QA/QC program conforming to BART specifications, the FTA QA/QC guidelines document (FTA-MA-06-0189-92-1), and ISO 9000. He managed, developed, delivered, and maintained the QA training program and audit program for the project, involving oversight of the QA and QC program implementation by the team, plus 50 consultants, subcontractors, and suppliers. He served as liaison with external auditors from the CHSRA, agencies, and FTA PMO, and he provided field QC inspection coverage as needed. He provided technical input to various field and office engineering issues, as well as coordination and resolution of nonconformances, including input for safety certifications for PUC approval. The project received a top rating from the FTA's senior oversight engineer, who noted that this quality management system program was the best he had seen in the country.

Zachry successfully implemented, administered and performed verification processes and self-certification on the TxDOT SH 130 Segments 5 & 6 project, and actively supported the validation efforts of TxDOT. This nearly $972 million dollar public-private-partnership design-build project required the development, implementation and administration of all QC, verification, validation, and self-certification measures. Each of these were successfully managed to ensure an early project delivery several months ahead of schedule. As a joint venture partner on the TxDOT DFW Connector project, Zachry successfully implemented, administered, and performed verification and self-certification processes on this $967 million dollar design-build project. During the project, Zachry supported the validation efforts of TxDOT. This project required the development, implementation and administration of all QC, verification, validation, and self-certification measures, each of which have been successfully managed to allow for a projected project completion date of one year ahead of schedule.

Parsons will provide and manage QA and QC for project design and construction, using its ISO 9001:2008-certified processes. Parsons' QA program applies to all projects it undertakes, anywhere in the world. Once design staff and others are indoctrinated, this standardization eliminates the need to retrain personnel from project to project and provides uniform processes throughout the company, which, in turn, enables multiple offices to support any project effort. In construction, inspection and reporting will be updated to fully comply with both project and Caltrans requirements. All of Parsons' projects have successfully implemented, administered, and performed the verification, validation, and self-certification processes.

Parsons has successfully delivered more than $20 billion in design-build transportation projects over the last 20 years. Parsons is also experienced with the CHSRA's quality processes through preparing preliminary design on the San Jose-to-Merced segment. The following are some examples of successful Parsons design-build projects:

- $365 million BART Oakland Airport Connector
- $1.4 billion Houston Metro Solutions
- $1.3 billion I-25 T-REX
- $783 million Alameda Corridor Mid-Corridor Trench
- $8.3 billion Long Island Rail Road (LIRR) East Side Access Projects
- $430 million DART Dallas Irving (Orange Line)
- $242 Mid-Jordan/Draper Project

Relevant example projects in which STV, Inc., has had a significant V&V and ICE/ISE role include the following:

- $2.8 billion DART LRT Extensions Phases I & II
- $2.2 billion FTA PMO for BART Capital Projects
- $6.2 billion Virginia Department of Rail and Public Transportation Rail to Dulles
- $450 million Houston METRO Rail Project Management
- $612 million New York City Department of Transportation Willis Avenue Replacement
- $150 million NYSDOT Robert Moses Causeway Construction Inspection

6. Safety and Security

6.1. SAFETY AND SECURITY CERTIFICATION APPROACH

Parsons has been recognized by the U.S. Department of Labor's Occupational Safety and Health Administration (OSHA), which awarded the firm its prestigious Corporate Voluntary Protection Program (VPP) Star status designation in 2009. Parsons is recognized by OSHA for having a world-class safety program and culture. Due to this, TPZP has designated Parsons to take lead responsibility for safety and security. Parsons will lead and oversee the construction security program for the project. Contractors will conduct their operations in a manner that will provide safe and secure working conditions for all employees and protections for the public and all others who may be affected by construction activities.

Safety and security certification is the process of verifying that a predetermined list of safety- and security-critical systems and subsystems, procedures, and training programs complies with a formal list of requirements at all key stages of project evolution. We will collaborate with the California High-Speed Rail Authority (CHSRA) to establish this plan in accordance with existing practices and standards established by the Federal Railroad Administration (FRA), the California Public Utilities Commission (CPUC), and the CHSRA.

The objective is to achieve an acceptable level of risk through a systematic approach to safety hazard and security vulnerability management, design criteria adherence, and specification and construction compliance. Tutor Perini/Zachry/Parsons, a Joint Venture (TPZP), will apply hazard management principles in conformance with the CHSRA Safety and Security Management Plan when designing and constructing elements that contribute to overall safety and security.

Safety and security certification is generally performed using a four-step process:

1. Identify the certifiable elements for the project.
2. Identify the safety and security requirements for the certifiable elements.
3. Review compliance for design, construction, testing, start-up, and warranty activities.
4. Document the entire process.

The Safety and Security Certification Plan (SSCP) will provide the CHSRA with assurance that TPZP has designed the project with all the safety-related and industry-standard requirements to ensure safe and reliable service.

> Joint Venture Board Policy: TPZP will take all practical steps to ensure the health, safety, and welfare of all employees, third parties, and the public who come into contact with the project.

We will establish an internal safety and security committee led by Doug Shelton, our Safety Manager, to oversee the implementation and compliance of the SSCP. To reinforce his authority, the safety manager reports directly to the joint venture executive committee. Doug has extensive experience developing and directing internal and external committees to conduct the needed coordination to streamline the safety and security certification process and to achieve completion under the rigorous schedules that design-build projects require.

Safety Manager – Doug Shelton

Doug Shelton has 18 years of experience and is a certified Occupational Safety and Health Administration (OSHA) instructor. He has managed the safety, health, environment, and security activities for numerous transportation projects, both in the field and from a technical perspective, throughout the United States. He also has experience working on projects with a contractor-controlled insurance program (CCIP).

TPZP is responsible for the safety and security certification activities associated with its work. TPZP will develop a SSCP that describes, in detail, how to identify, mitigate, verify/validate, and certify safety and security requirements. The SSCP will include, but not be limited to, the following:

- Organizational structure identifying personnel responsible for safety and security certification activities.
- Qualifications of safety and security personnel. Personnel must have adequate experience in either railroad safety or security, or both, and be able to demonstrate proficiency in hazard management, safety and security hazard analysis, verification, validation, and self-certification processes, as supported by their resumes.
- A method for demonstrating that the work is designed and constructed in conformance with the system-level preliminary hazard analysis reports, site-specific hazard analysis reports, and the CAHSR Safety and Security Management Plan (Book 3).

- Regular updates to and expansion of the certifiable elements and hazards log. Hazards associated with each certifiable element that can reasonably be expected to occur in the CAHSR system will be identified on the certifiable elements and hazards log.
- Hazard and vulnerability mitigations are identified as output from site-specific hazard analyses and are put into the verification and validation process for the creation of certifiable items lists.
- Management of the verification and validation of safety and security requirements, in conformance with TPZP's verification and validation plan.
- Completion of the safety and security certification package in compliance with the requirements of the CAHSR Safety and Security Management Plan and the CAHSR Verification and Validation Management Plan. A safety and security certification package will be compiled by TPZP when all certifiable items lists for a particular element or infrastructure component are completed for applicable milestone payments. The safety and security certification package will consist of a signed certificate of conformance for the project element; all completed certifiable items lists; a completed certifiable elements and hazards log; and all supporting documentation such as hazard analysis, drawings, and design element descriptions.
- Outreach to safety and security stakeholders, including, but not limited to, emergency response agencies, adjacent railroad operators, adjacent highway agencies, and local communities.
- Participation in the CHSRA monthly safety and security project committee meetings, monthly fire and life safety and security committee meetings, and other committee meetings, as identified by TPZP or the CHSRA. Committee meeting participation will occur until final acceptance and will facilitate consistent, comprehensive, and recorded communication of information pertinent to the fire and life safety and the security of the project.

The safety and security committee's responsibilities will include the following:

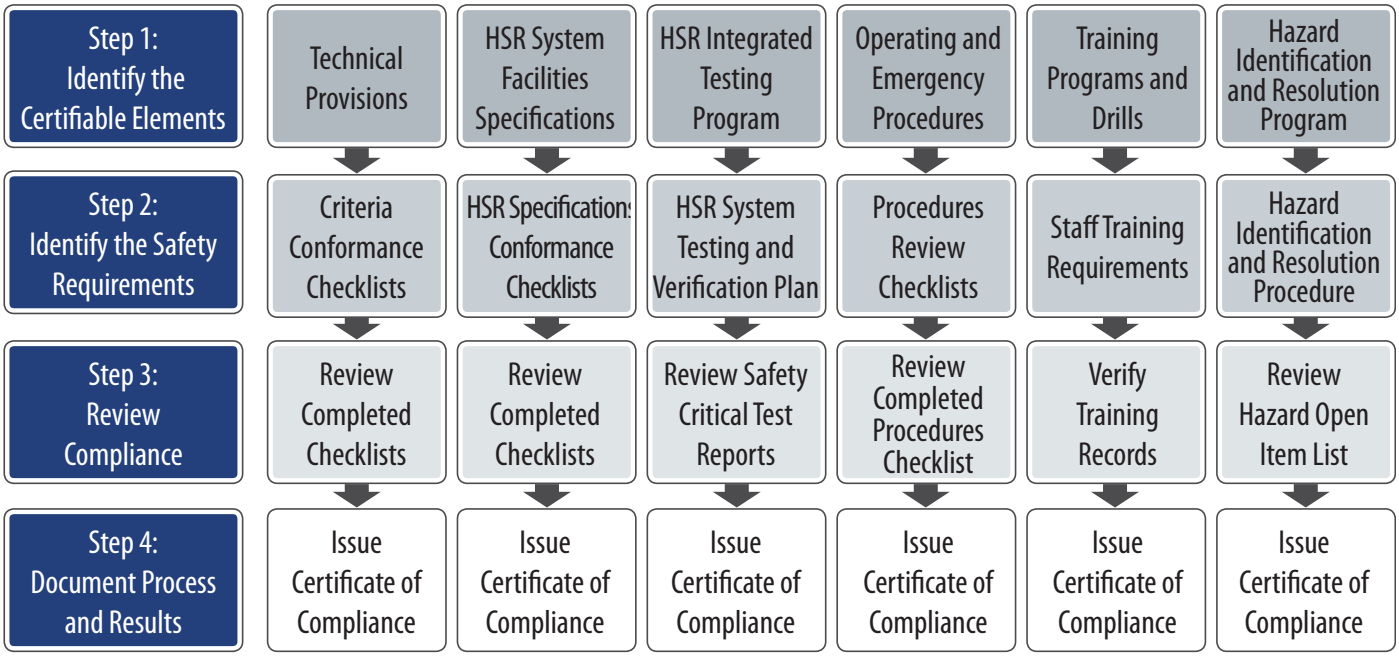
- Reviewing safety and security items for compliance
- Reviewing safety and security specifications
- Reviewing/resolving hazards as part of the hazards management plan
- Reviewing/conducting audits of the safety program
- Recommending, upon successful completion of the safety and security certification process, to the CHSRA that the system has been designed, built, and tested as per the approved design criteria

A more detailed overview of safety and security certification is shown in Figure 6-1, which describes four general steps. Initially, certifiable elements are identified from related specifications and requirements. Next, the safety requirements will be identified and checklists or procedures will be prepared. After the work progresses, procedures, checklists, and reports will be reviewed for compliance. Finally, the process will be documented when signed certificates of compliance are issued to verify the completed results.

Worker Involvement and Participation

First-line supervisors are responsible for implementing all safety and security programs and ensuring that workers understand and comply with these requirements.

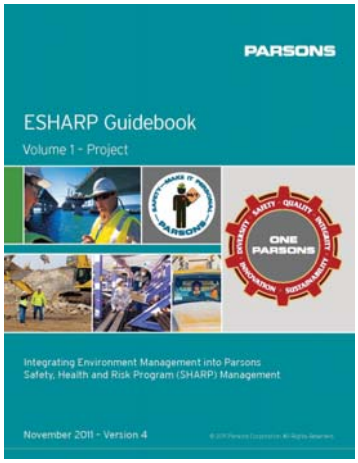
Figure 6-1 – Safety and Security Certification



6.2. SAFETY AND SECURITY APPROACH DURING CONSTRUCTION AND WARRANTY PHASES

It is the policy of the CHSRA to perform work on this project in a manner that ensures the safety and security of employees, contractors, emergency responders, and the public. The application of safety and security is a fundamental hazard and vulnerability management process that incorporates the characteristics of the planning, design, construction, testing, operational readiness, and subsequent operation of the high-speed train system. Safety and security are priority considerations in the planning and execution of all construction and warranty work activities on the project. TPZP will coordinate the design, construction, testing, and warranty phases of this project through the safety and security certification plan described above.

6.2.1. Site-Specific Health and Safety Plan



TPZP has a goal of zero incidents. It will be the policy of TPZP that employees should never perform a task that may endanger their own safety or the safety and health of others or create a hazard that potentially exposes others to unsafe conditions. In line with our zero-incident philosophy, TPZP will follow Parsons' Environmental, Safety, Health, and Risk Program (ESHARP), which integrates environmental, safety, health, and risk requirements with project goals to manage overall project construction and public safety. The zero-incident philosophy originated with a study by the Construction Industry Institute (CII) that identified specific control measures shown to dramatically reduce the probability of incidents. These control measures, known as zero-incident techniques, provide the framework for ESHARP management, Parsons' proactive approach to managing the interrelated fields of environment, safety, health, and risk management.

The nine zero-incident techniques consist of the following:

1. Demonstrated management commitment
2. Staffing for safety
3. Safety planning
4. Safety training and education
5. Worker involvement and participation
6. Recognition and rewards
7. Subcontractor management
8. Accident/incident investigation and reporting
9. Drug and alcohol testing

Parsons' safety performance has also been recognized by OSHA, which awarded the firm its prestigious Corporate VPP Star status designation in 2009, making Parsons the first U.S. engineering/construction company to be so honored.

One of the major benefits that ESHARP management offers to our clients is the program's ability to protect all parties involved in the construction process. If implemented properly, ESHARP serves as a built-in daily protector of the client's best interest — the protection of people, property, and the environment.

ESHARP Delivers Results

On October 26, 2009, the Dubai Metro Line project achieved 1 million hours worked without experiencing a recordable injury — the result of the successful implementation of ESHARP, which TPZP will use for the CAHSR CP1 project.

The project site-specific health and safety plan (SSHSP) will be tailored to CHSRA safety rules and FRA regulations. All management personnel will be trained in the foundations and philosophy of ESHARP management through supervisory training in accident reduction techniques, known as the START program. This training lays the groundwork for ESHARP management by

OSHA VPP Participation

VPP Voluntary Protection Programs An OSHA Cooperative Program

Parsons' safety performance is recognized by OSHA, which awarded the firm its prestigious Voluntary Protection Program (VPP) Star status designation in 2009, making Parsons the first U.S. engineering/construction company so honored. As a result, Parsons is known for having a world-class safety program and culture, from its management structure down through all employees. Twelve projects and facilities completed by Parsons have achieved STAR status as participants in the VPP.

instilling accountability and responsibility for the safety and risk process in all employees. All supervisors must complete ESHARP/START training. Immediately after the notice to proceed (NTP), the TPZP Project Manager/Director's highest priority will be the development of the SSHSP. The Project Manager/Director, Josh Randall, will assign the development of the SSHSP to the Safety Manager and other members of the project team.

6.2.2. Site-Specific Security Plan

Security at construction sites is designed to ensure that all personnel working at the site, the CHSRA's assets and property, and the surrounding communities are protected from trespassers, vandalism, theft, encroachment, and illegal dumping. In compliance with these provisions, TPZP will develop a site-specific security plan (SSSP) that addresses crime- and security-related conditions. This includes protection of property, materials, tools, equipment, and personal property of workers at all sites. Security measures are to be provided by all contractors at each site and may differ from site to site based upon the security assessments performed.

Protection of Materials and Equipment

TPZP will develop a site-specific security plan that addresses protection of property, materials, tools, equipment, and the personal property of workers.

Parsons will lead and oversee the construction security program for the project. Contractors will conduct their operations in a manner that will provide safe and secure working conditions for all employees and protections for the public and all others who may be affected by construction activities. TPZP will maintain the security integrity between the public areas and construction sites. During all phases of construction, the construction areas will be protected from public access.

TPZP will furnish and erect all barricades, warning signs, and markings for hazards before commencing work that requires such erection and will maintain the barricades, warning signs, and markings for hazards until dismantled.

Restricted areas will be fenced and must remain fenced at all times. Any required temporary fences and/or gates will be provided by TPZP. These gates will remain closed and locked, or a guard will be provided at TPZP's expense.

6.3. SAFETY AND SECURITY MANAGER QUALIFICATIONS

Our Safety Manager, Doug Shelton, CSM, will lead our safety and security program and plan development. He has managed the safety, health, environmental, and security activities for numerous transportation projects, both in the field and from a technical perspective, throughout the United States.

6.3.1. Experience Profile

Doug Shelton, CSM, a former OSHA compliance officer, has more than 18 years of construction, aviation operations, safety, and security experience, including on LEED projects. Doug holds the following accreditations: certified safety manager (CSM); certified safety auditor; instructor of OSHA, certified under the Federal Aviation Administration (FAA); and CPR/first-aid/automated external defibrillator (AED) certified. Doug has comprehensive knowledge of private insurer and owner-controlled insurance and contractor-controlled insurance programs (OCIPs/CCIPs).

6.3.2. Project Experience

Safety Manager, Metrolink Positive Train Control (PTC), California

Doug is supervising the PTC project safety and health on this $120 million project, including auditing and assisting in certifying vendor/integrator personnel within the Southern California Railroad Authority workers protection requirements. He is also reviewing and approving subcontractor site-specific work plans.

Safety and Security Manager, MIA Mover Automated People Mover System, Miami, Florida

As safety, health, environment, and security manager, Doug structured the site safety and security plan in accordance with Dade County, FAA, the Florida Department of Transportation (FDOT), and company regulations. The $259 million project involves 1.2 miles of dual overhead column guideways and overhead and maintenance storage facilities for the Crystal Mover passenger cars. He participates in weekly and monthly meetings with subcontractors, the airport, FDOT, CSX, the Transportation Security Administration (TSA), and project executives. Doug's responsibilities include managing field activities to ensure a safe working environment, coordinating safety training for the client staff and subcontractors, and managing the maintenance of traffic. The project was included in OSHA's VPP for excellence in safety management and administration.

Safety Manager, Miami International Airport New South Terminal, Miami, Florida

Doug monitored the trade contractor's implementation of a safety and health program; presented weekly field, OCIP, and security updates and planning statuses; conducted safety orientation; and structured training courses for orientation, rigging, excavation, and crane inspection. The $844 million project involved 3.5 million square feet of renovation and new construction, air and landside operations, rooftop guide and passenger rail systems, passenger gates, and underground diesel tank installation. Doug acted as the field representative for both safety and security departments and ensured a safe working environment. He developed systems for managing demolition plans, high-risk activities, scaffolding, and fixed-location material hoists.

Table 6-1: Safety and Security Certification (SSC) Plan Outline

1	Develop safety and security policy.
2	Assign SSC responsibilities.
3	Establish safety and security committees.
4	Identify existing safety and security requirements for acquisition process.
5	Develop safety and security certification plan.
6	Identify safety and security certifiable elements and items.
7	Initiate project documentation systems.
8	Perform preliminary hazard vulnerability analysis.
9	Prepare safety and security design criteria.
10	Integrate operations and maintenance requirements into design.
11	Develop design criteria conformance checklists.
12	Perform safety and security design reviews.
13	Perform additional hazard and vulnerability analysis (as applicable).
14	Implement hazard and vulnerability resolutions and tracking.
15	Verify design criteria conformance checklists.
16	Identify safety and security requirements for test program plans, integrated testing, and operational readiness.
17	Develop specifications conformance checklists.
18	Complete specifications conformance checklists.
19	Issue permits and certificates (as applicable).
20	Complete integrated tests.
21	Conduct safety and security review of engineering change orders and waivers.
22	Complete operations and maintenance plans, procedures, and testing.
23	Complete operational readiness review (including workarounds).
24	Issue final safety and security certifications.
25	Issue final safety and security verification report.

Safety Director, Turner Construction Co., Boston, Massachusetts; San Diego, California; and Southern Nevada

Serving as safety director for three offices, Doug oversaw all safety and drug test policies and procedures; the implementation for more than 30 projects, up to $450 million each; and the implementation and facilitation of all staff safety-training programs. He conducted outreach programs for subcontractors, educated and trained personnel, and acted as a field representative to ensure a safe working environment. From 2001 to 2006, while acting as safety manager, there was zero lost time due to injury.

Fall Protection

TPZP will implement established, proven procedures to protect workers from falls, including conventional systems such as guardrail systems, safety net systems, and personal fall arrest systems, as well as through the use of safe work practices and training.

Corporate EH&S Director, Sabreliner Corp./ Aviation Management Systems, Inc., Phoenix, Arizona; Goodyear, Arizona; and Orlando, Florida

Doug served as a director for three safety coordinators and a work force of 1,500 while performing aircraft maintenance. His $6 million (monthly) self-insured maintenance schedule included A, B, C, and D classifications. Doug restructured a corporate environment, health, and safety (EHS) program that helped to ensure compliance with all federal, state, county, and city regulations for environmental compliance, safety, and security. The EHS program included a large-quantity generator for hazardous waste, stormwater pollution prevention plans (SWPPP), security, FAA orientation, and the transportation of dangerous goods.

Crane Capacity and Safety

TPZP will ensure adequate crane capacity and safe construction activities by carefully calculating lift loads, fully evaluating site conditions, and assigning qualified operators.

6.4. SAFETY AND SECURITY CERTIFICATION PLAN OUTLINE

A draft outline for a safety and security certification plan is listed in Table 6-1.

6.5. SITE-SPECIFIC HEALTH AND SAFETY PLAN OUTLINE

A draft outline for a site-specific health and safety plan is included in Table 6-2.

6.6. SITE-SPECIFIC SECURITY PLAN OUTLINE

A draft outline for a site-specific security plan is included in Table 6-3.

Table 6-2: Site-Specific Health and Safety Plan

1	Preface
2	Introduction *A. Parsons' Safety, Health, and Environment Policy* *B. Project Safety, Health, and Environment Plan Overview* *C. Subcontractor Safety, Health, and Environment Plan*
3	Project Scope of Work *A. Overview* *B. Parsons' Safety, Health, and Environment Plan Application*
4	Project Safety Management Responsibilities and Authority *A. Safety, Health, and Environment Management Responsibility Matrix* *B. Identification of Key Personnel*
5	Administrative Phase Activities *A. Project Safety, Health, and Environment Committee* *B. Employee Orientation* *C. Awareness Campaign* *D. Stakeholder Alignment Meeting* *E. Training Plan* *F. Safety, Health, and Environment Meetings* *G. Rewards and Recognition* *H. Measurement and Reporting* *I. Incident Investigation* *J. Medical Requirements and Workers' Compensation*
6	Preconstruction Phase Activities *A. Risk Analysis and Safety Specifications Development* *B. Design and Constructability Review* *C. Prebid Meeting Requirements* *D. Subcontractor Prequalification Review* *E. Preconstruction Safety Meeting* *F. Competent Persons Submission Review* *G. Premobilization Safety Meeting* *H. Subcontractor Safety Plan and Review*
7	Construction Phase Activities *A. Site Risk Analysis* *B. Risk Mitigation Planning (Two-Week Look-Ahead)* *C. Activity Hazard Analysis* *D. Personal Protective Equipment Required* *E. Safety Systems Audit Protocol* *F. Construction Site Inspection* *G. Safety and Health Enforcement* *H. Subcontractor Management*
8	Safety Training Plan
9	Recordkeeping and Posting Requirements
10	Regulatory Compliance
11	Hazard Correction
12	Employee Communication
13	Disaster, Personal Security, and Emergency Action Plan
14	Hazard Communication Program

Table 6-3: Site-Specific Security Plan Outline

1	Management Commitment and Philosophy
2	Integration of Safety and Security into the Project Development Process
3	Assignment of Safety and Security Responsibilities
4	Safety and Security Analysis
5	Development of Safety and Security Design Criteria
6	Process for Ensuring Qualified Operations and Maintenance Personnel
7	Safety and Security Verification Process
8	Construction and Security
9	Emergency Planning
10	FRA Coordination (if needed)
11	Department of Homeland Security

Trench/Stockpile Safety

TPZP will furnish, erect, and maintain markings and associated lighting of open trenches, excavations, and temporary stock piles.

6.7. SAFETY HISTORY OF TPZP

Experience modification rates (EMRs) from California/National Council on Compensation Insurance (NCCI) for the TPZP joint venture firms from 2007 to 2012 are listed in Table 6-4.

Table 6-4: Experience Modification Rates

EMR	Tutor Perini	Zachry *	Parsons
2012	0.81/0.85	0.40	0.61/0.54
2011	0.87/0.99	0.57	0.59/0.58
2010	0.88/0.99	0.58	0.50/0.61
2009	0.82/0.93	0.53	0.43/0.60
2008	1.41/0.82	0.55	0.44/0.64
2007	1.36/0.88	0.53	0.50/0.77

*Note: * indicates NCCI EMR rates only (CA not available).*

The Tutor Perini EMR rates have improved dramatically over the past five years for the following reasons:

- In 2008, the EMR is a reflection of the Tutor-Saliba Corp. in California. During 2008, Tutor-Saliba was merged with Tutor Perini, so that by 2009, the EMR reflected the merged company.
- After the merger, the successful Tutor Perini safety culture was driven to all managers and staff, which resulted in dramatically improved safety processes.
- After the merger, there were dramatic changes/improvements to the safety personnel and related attitudes among the workforce.

Serious violations and mitigation for the joint venture firms from 2007 to 2011 are illustrated in Table 6-5. TPZP does not have any willful or repeat violations during this period.

Table 6-5 – Violations and Mitigation/Remediation

	Type	Penalty	Root Cause	Mitigation
Tutor Perini	Fed-OSHA #311242481 Serious. 3/10/2008	$7,000	• 1926.501(a)(2) - Duty to have fall protection - scaffold plank broke.	The issues that were cited were corrected at the time of inspection. Further meetings were held with employees, including retraining, to prevent from reoccurring.
	NY-OSHA #311280143 Serious. 1/11/2008	$600	• 1926.403(b)(1) - Electrical equipment inspections.	Same as above
	NY-OSHA #311280143 Serious. 1/11/2008	$600	• 1926.605(b)(2) - Inadequate access to marine operation/equipment.	Same as above
	NY-OSHA #311280143 Serious. 1/11/2008	$600	• 1926.1053(a)(13) - Inadequate distance between fixed ladder cleats/steps.	Same as above
	NY-OSHA #311280135 Serious. 12/21/2007	$500	• 1926.152(e)(4) - Combustible dispensing units not protected from damage.	Same as above
	NY-OSHA #311280135 Serious. 12/21/2007	$750	• 1926.350(a)(10) - Oxygen cylinders not separated from combustible materials.	Same as above
	NY-OSHA #311280135 Serious. 12/21/2007	$750	• 1926.605(d)(3) - No buoyant vests when working on unguarded decks.	Same as above
Parsons	Cal-OSHA Serious. 12/28/11	$6,750	• Title 8, Section 1522(a) - Employer did not provide adequate eye, face, hand, and body protection to employee.	General work permit was developed for work in high-risk environments. Provided all required personal protective equipment (PPE). Provided training in required PPE.
	Cal-OSHA Serious. 12/29/11	$18,000	• Title 8, Section 1637(k)(1) - Scaffold was being erected without supervision and direction of a qualified person.	General work permit was developed for work in high-risk environments. Scaffold erection team was established. The scaffold erection team was trained.

Notes:

1. This table includes violation details for Tutor Perini only. Violation details for wholly owned subsidiaries of Tutor Perini are available upon request.

2. The two Parsons citations are being contested and, therefore, are not closed.